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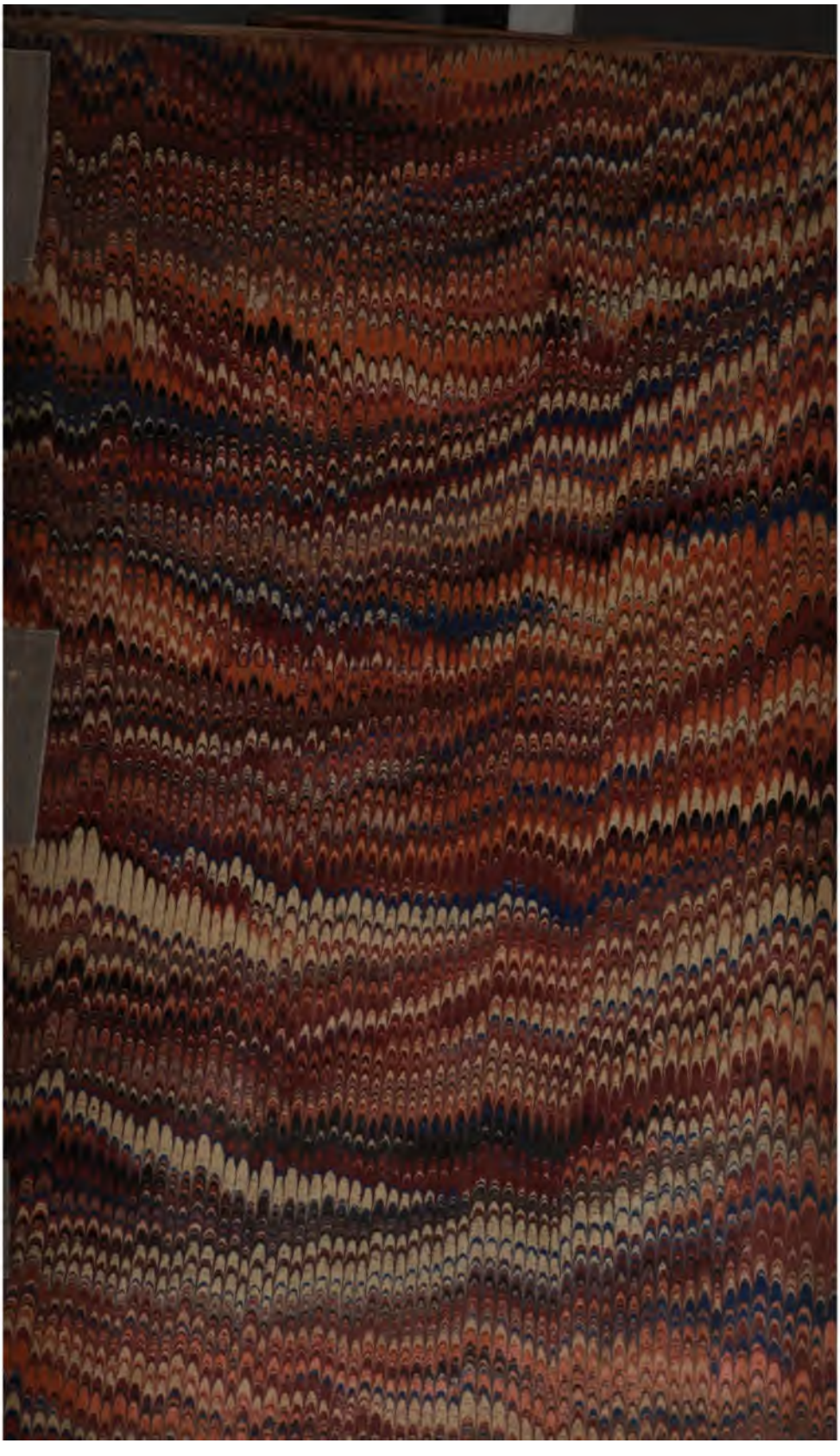

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THE

STUDY OF MEDICINE.

BY JOHN MASON GOOD,
M.D. F.R.S. F.R.S.L.
MEM. AM. PHIL. SOC. AND F.L.S. OF PHILADELPHIA.

IMPROVED FROM THE AUTHOR'S MANUSCRIPTS,

AND BROUGHT DOWN TO THE LATEST ADVANCES IN

Physiology, Pathology, and Practice.

BY SAMUEL COOPER,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF LONDON, ETC.

SIXTH AMERICAN, FROM THE LAST ENGLISH EDITION.

WITH NOTES,

BY A. SIDNEY DOANE, A.M. M.D.

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A SKETCH OF THE HISTORY OF MEDICINE,

FROM ITS ORIGIN TO THE COMMENCEMENT OF THE NINETEENTH CENTURY.

BY J. BOSTOCK, M.D. F.R.S.

IN TWO VOLUMES.

VOL. I.

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TO

JOHN W. FRANCIS, M.D.,

Late Professor of Materia Medica, Institutes of Medicine, Medical Jurisprudence, Obstetricks and the Diseases of Women and Children in the University of the State of New-York; Member of the Medical and Chirurgical Society of London; of the Wernerian Natural History Society of Edinburgh; of the Academy of Natural Sciences of Philadelphia; of the Lyceum of Natural History of New-York; of the Historical Society of Massachusetts and of New-York; of the Literary and Philosophical Society of New-York, &c.

THE

SIXTH AMERICAN EDITION

OF

GOOD'S STUDY OF MEDICINE

IS DEDICATED,

BY HIS OBLIGED FRIEND,

A. SIDNEY DOANE.

New-York, August, 1835.

PREFACE OF THE AMERICAN EDITOR.

The sixth American edition of the "Study of Medicine" is reprinted from the fourth English edition, which was issued in London early in the present year: beside the ample additions of Professor Cooper, it contains between four and five hundred notes of a practical character, derived principally from the writings of American physicians.

It was with extreme diffidence, and with no little dread of appearing presumptuous, that the American Editor assumed the responsibility of adding notes to a work characterized by such profound learning and deep research: but he was encouraged by the consideration, that although the "Study of Medicine" has been used as a text-book for several years in this country, and is thought to be indispensable to every medical library, it contains but few allusions to the important results of American practice; while some forms of disease peculiar to this country, and the contributions of American physicians to physiology, pathology, therapeutics, and the materia medica, are, generally speaking, unnoticed in it.

In fulfilling his duty, the Editor has attempted to divest himself of local feelings; to consider the physicians of the United States as belonging to one family; to be just to all; and to present the results of their experience with fairness. How far he has succeeded, may be seen by referring to the notes marked with the letter D., for which he alone is accountable. The desire, however, of printing the new edition in such a form as to place it within the reach of every one, and the constant inquiries for the book, which, to speak technically, has been out of print for many months, obliged the publishers to limit the Editor both as to space and time. This fact will account for the brevity with which many important topics have been treated, and also for some omissions.

To those of his professional brethren who have so kindly tendered the results of their experience, the Editor returns his warmest acknowledg-

ments and thanks; and to no one are these due more than to a personal friend of Doctor Good, Professor J. W. Francis, of New-York, not only for many practical remarks of great importance, but also for the use of his extensive library of rare books, and for a free access to his valuable cabinet of anatomical preparations, which, in many cases, has afforded the Editor an opportunity of verifying the statements of the text.

Prefixed to the "Study of Medicine," the reader will find a new "History of Medicine," by the learned and eloquent Bostock; it forms a happy introduction to the main work, and its perusal will richly reward the careful reader.

232 Grand-street,
New-York, August 1, 1835.

THE

HISTORY OF MEDICINE,

FROM ITS ORIGIN TO THE COMMENCEMENT OF THE NINETEENTH CENTURY.

BY J. BOSTOCK, M.D. F.R.S.

HISTORY

OF

MEDICINE,

FROM ITS ORIGIN TO THE COMMENCEMENT OF THE NINETEENTH CENTURY

By J. Bostock, M.D. F.R.S.

CHAPTER I.

Introduction—Division of the History of Medicine into three great Chronological Periods—History of Medicine previously to its Introduction into Greece—Origin of Medicine—State of Medicine among the Egyptians—Among the Assyrians—Among the Jews—Introduction of Medicine into Greece—Chiron—Æsculapius—Machaon—Podalirius—The Asclepiadæ—Records in the Temples of Æsculapius—Ancient Inscriptions—Pythagoras—Democritus—Heraclitus—Acron—Herodicus—Gymnastic Medicine.

Although the primary object of this treatise is to present a view of the history and progress of practical medicine, yet it will be impossible to avoid entering occasionally into the consideration of the various theories and speculations which have so generally prevailed in the science. Medical theory and practice have been so intimately blended together, that it would be useless to attempt to separate them. The terms which are employed in works of the most practical nature are, for the most part, derived from the theory which was current at the time of their publication; and even the narrative of facts, and the direct details of experience, are, with a few exceptions, deeply tinged with the prevailing doctrines of the day, or with the individual speculations of the writer. Those who are versed in medical science, and who are acquainted with the relation which it bears to the other physical sciences, with the mode in which it is acquired, and the nature of the evidence on which it rests, will easily perceive that, in this department, it is peculiarly difficult to separate facts from hypothesis. It may, however, be asserted, that until this be accomplished, medicine can never be placed upon the basis of induction, and that this alone can give it that stability which may entitle it to be regarded as a correct science. In its present condition, it will be impossible to do more than to approximate to so desirable a state; but it will be a special object of attention in the following pages to endeavour to point out the limits between practice and theory, between facts and the opinions that have been deduced from them.

When we take an extended view of the progress of medicine, tracing it from its scanty sources, in the most remote periods of society, and observe its course, as gradually augmented by the stores of Grecian and Roman learning, obscured by the darkness of the middle ages, and again bursting forth in the copious and almost overwhelming streams of modern literature, we are naturally led to separate the narrative into three divisions, corresponding to the three great chronological periods. The first of these will comprehend the history of practical medicine, from the earliest records which we possess to the decline of Roman literature; the second will contain an account of the state of the science through what are termed the dark ages until the revival of letters; the third will commence with the establishment of the inductive philosophy, and be continued to the commencement of the nineteenth century.

In tracing the history of this science from its earliest records, it will not be necessary to devote much time to a subject which was formerly discussed with great learning and acuteness, viz. the origin of medicine. It may be sufficient to remark, that in proportion to the progress of civilization or refinement, attempts would be made to remove or alleviate the diseases, and to repair the injuries to which the body is constantly incident. Subject as it is at all times to the influence of various noxious agents, and to a consequent derangement of its functions, to painful affections of various kinds, and to the loss or depravation of its powers or actions, we must conceive that mankind would be anxious to remove or relieve these evils. The means that would be employed must have been, in the first instance, extremely imperfect, and frequently ill-directed. They may have been suggested by the effects of certain kinds of food, or by the operation of certain external agents on the body: some analogies may have been derived from the spontaneous actions of the system, by observing the natural efforts of the constitution to remove certain causes of disease, or to relieve the patient when suffering from their effects. Thus, in the earliest periods of society, mankind must have been aware of the relief which was obtained in the derangements of the alimentary canal by an evacuation of its contents, and would probably have discovered, incidentally, that certain vegetable substances promoted this operation. In the external injuries to which the body is subject, more especially in a rude state of society, means would early be had recourse to for procuring present ease from pain, or for removing the obvious danger to life which would so frequently follow from various causes. It would soon be found that the pain was diminished by excluding the wounded part from the air, or from other extraneous substances; that by certain modes of pressure, the flow of blood might be restricted; and that in some cases an increased and in others a diminished temperature gave immediate ease to the patient, and tended to promote the ultimate cure. A rude species of medical and surgical practice of this description has been in all cases found to exist in newly-discovered countries, even when in the most barbarous state; while it has been observed, generally, that the improvement in the healing art has been nearly in proportion to the advancement of the other arts of life, and to the gradual progress of knowledge on all subjects intimately connected with our existence or welfare.

The historical records which we possess respecting the progress of practical medicine are scanty and uncertain; but so far as they extend, they coincide with the view of the subject taken above. The writers who have investigated this point with the greatest learning and assiduity, inform us that Egypt was the country in which the art of medicine, as well as the other arts of civilized life, was first cultivated with any degree of success, and that it had advanced so far as to have become a distinct profession. We are not, however, informed in what degree or to what extent that distinct appropriation was carried; whether medicine was made the exclusive business of certain individuals, who were regularly instructed for that purpose; whether it was attached to certain public functionaries, especially to the priests; or whether persons in different situations applied themselves to the practice of medicine from a real or supposed superiority in their skill and in their knowledge of the treatment of diseases. The probability, however, is, that the priests of the Egyptians were at the same time their physicians. This appears to have been the case among the Jews and the Greeks, who are supposed to have borrowed from the Egyptians many of their institutions; and indeed it seems to be the natural progress of society in its earlier periods, when the priests were generally the depositaries of knowledge of all kinds, and when they confined it as much as possible to their own use, for the purpose of maintaining their influence over the rest of the community.

From some remarks which are made incidentally in the writings of the ancients, respecting the medicine of the Egyptian priests, it would appear that it consisted in a great measure of the employment of magical incantations, and, so far therefore as it effected the cure of disease, must have operated through the medium of the imagination. This has been in all cases the first step in the art of medicine, if it may be so called, and its efficacy must have been in exact proportion to the ignorance and superstition of the people on whom it was exercised.*

A circumstance respecting the practice of medicine in Egypt is mentioned by

* *Le Clerc*, Hist. de la Médecine, par. i. liv. i. chap. 12.

Herodotus as existing when he visited that country, and which it may be presumed was transmitted from a much earlier period, that certain individuals treated certain diseases only.* This division into separate branches might, at first view, seem to indicate a degree of manual dexterity and of minute observation in certain departments. But, independent of any other consideration, we may rest assured that the science must have remained in a state of complete degradation, when we bear in mind that it was the custom in Egypt, as it is in the present day among many of the nations of the East, to transmit the same occupations from father to son, through a number of successive generations. This practice, although it may be favourable to the perfection of an art, or even of a science, in some of its minute details, must furnish an almost insurmountable obstacle to its general improvement, or to the development of the powers and faculties of the human mind.

Although we are in the habit of considering Egypt as the parent of the arts and sciences, the empire of Assyria has been supposed, by many learned men, to possess a greater claim to this distinction. Perhaps the priority of invention may be justly awarded to the Assyrians, but the memorials which they have left behind them are so scanty, that the degree of excellence to which they arrived is almost entirely conjectural. The priests of this nation, as in all other cases, appear to have been the depositaries of all the learning of the times, and of that of medicine among the rest. We have reason to suppose that their practice consisted of little more than the dexterous application of magical arts, and such other means as tended to impress the minds of the people with a sense of their power over the operations of nature, while any actual information which they possessed was carefully concealed under the guise of mystery and superstition.†

In the writings of Moses there are various allusions to the practice of medicine among the Jews, and more especially with regard to the treatment of leprosy. The priests appear in this, as in other cases, to have been the practitioners; the treatment consisted principally in certain regulations for the purpose of promoting cleanliness and preventing contagion, together with various ceremonies, which, so far as they could affect the patient, must have acted entirely on the imagination.‡ So little is known respecting the state of the arts and sciences in the other countries of the East, at these remote periods, that it is scarcely necessary to allude to them in this place. We shall only remark, that the imperfect and scanty notices which we possess on this subject would lead us to conclude, that the practice of medicine was even in a less advanced state than among the Egyptians, its progress being regulated by the greater or less degree of refinement or civilization of the respective countries, but in no case having advanced beyond the state of implicit credulity and gross superstition.§

After having given an account of the state of medicine among the ancient Egyptians and other contemporary nations, as far as can be gleaned from the scanty records that remain on this subject, we must follow it into Greece, and trace its progress from the period of its first introduction in the remote and semi-fabulous ages of their *demigods* and *heroes*, until it acquired the rank of a science under the genius of Hippocrates. It is generally admitted, that although Greece cultivated the arts and sciences with so much success, yet, in the first instance, she borrowed them from the neighbouring nations; principally, as it would appear, from Egypt, and in some cases from Phœnicia.‖ To certain individuals who migrated from these countries, the Greeks themselves were in the habit of referring the introduction of many of the most useful inventions; and during a considerable space of time all those who were desirous of acquiring a larger share of knowledge, either

* Euterpe, §. 84.

† *Herodotus*, Clio, passim. *Enfield's* History of Phil. v. i. p. 25 et seq.

‡ Leviticus, chap. xiii.-xv. *Michaelis*, on the Laws of Moses, chap. 4, art. 210-11.

§ For further information respecting the state of medicine among the Egyptians and the other nations of antiquity, previously to the Greeks and Romans, the reader is referred to the following works. *Herodotus*, Euterpe et Clio, passim. *Diodorus Siculus*, lib. i. sect. 25, 82. *Plinius*, lib. vii cap. 56, lib. xxix. cap. 1. *Plutarchus*, De Iside et Osiride. *Josephus*, Antiq. Jud. lib. viii. cap. 2. §. 5. *Clemens Alexandrinus*, à Potter, Stromat. lib. vi. p. 758. *Conring*, Introd. Art. Med. cap. 3. §. 2. et De Hermet. Med. passim. *Barchusen*, Diss. no. 1 et 7. *Gruner*, Analecta, Dis. 1. De Ægyptiorum Veterum Anatome. *Schulz*, Hist. Med. p. 1. §. 1. *Le Clerc*, par. 1, liv. i. chap. 1-8. *Sprengel*, Hist. de la Méd. par Jourdan, §. 2. chap. 1-3. *Enfield's* Hist. of Phil. v. i. p. 86, 7 et alibi. *Pauw*, on the Egyptians and Chinese, part 1, §. 2. *Bryant's* Analysis, v. 2, p. 324 et seq. et in multis aliis locis. *Cabanis*, Révol. de la Méd. chap. 2, §. 1. *Ackermann*, Instit. Hist. Med. p. 1. chap. 1, 2. *Lauth*, Hist. de l'Anatomie, liv. i. *Blumenbach*, Introd. in Historiam Medicinæ Litter. §. 1-3.

‖ Vide *Bryant*, ubi supra, et v. ii. p. 426 et seq. et alibi.

theoretical or practical, than was possessed by their countrymen, visited Egypt, as the great storehouse of science and learning. It is from this cause that we find so much analogy between the divinities that were worshipped in the two countries, as inventors or patrons of the various arts and sciences. For although they acquired new names on their being transferred into Europe, yet their attributes, and even their forms, clearly demonstrate their origin. This is particularly the case with respect to medicine, so that in the Orus and Thouth of the Egyptians we may recognise the prototypes of the Apollo and Hermes of the Greeks.*

It is not until comparatively at a late period, approaching to that of the Trojan war, that we find the names of actual personages who practised medicine in Greece: and of these, it is probable that some were natives of either Africa or Asia, who brought with them the information which they had acquired in their respective countries. Of those whose history is better known, and who were acknowledged to be of Grecian origin, it was the general custom to travel into Egypt for the purpose of obtaining a knowledge of their art, and with this view they submitted to a system of rigid discipline, and to a variety of irksome and burdensome ceremonies; and after all this laborious process, so far as the science of medicine is concerned, the result seems to have been little more than the knowledge of magic and incantations, with some rude notions respecting the application of external remedies for the cure of wounds and of cutaneous diseases, with a very imperfect idea of the anatomy of the human body, and a very inadequate conception of its functions.†

The first native of Greece who is more particularly singled out, as having introduced the art of medicine to his countrymen, is the centaur Chiron. There is much mystery attached to his character and to every thing connected with him, but what we may consider as the most probable conclusion is, that he was a prince of Thessaly, who lived about the thirteenth century before the Christian era; that he was distinguished above his contemporaries for his knowledge of the arts of life; and that, after the manner of his countrymen, he was frequently seen on horseback, so as to give rise to the fabulous account of his compound form. He is particularly celebrated for his skill in medicine and in music; a combination, it may be remarked, that was said to have existed in many other individuals. We are not informed by what means he obtained his superior knowledge in medicine; but there are various circumstances which lead us to conclude that it was at that time regarded rather as a part of the education of all men of rank, than as attached to a particular profession. We accordingly find that he instructed the Argonauts in medicine, and the heroes who were engaged in the siege of Troy; and that all the kings and warriors of that period were more or less acquainted with the treatment of wounds, and even with the practices which were adopted for the cure of internal diseases.‡

But although Chiron has the reputation of having introduced the art of medicine into Greece, it is to his pupil Æsculapius that, by the common consent of antiquity, is ascribed the merit of having first devoted himself to the cultivation of medicine as a science, and of having made it a distinct object of pursuit. The improvements which he made in the art were so considerable as to have induced his countrymen after his death to pay him divine honours, to designate him as the god of physic, to erect temples to him in various parts of Greece,◊ and to derive his origin from Apollo himself. His history, when divested of all the fabulous appendages that were attached to it by his contemporaries, appears to be, that he was a native of Epidaurus, that he was exposed in his infancy, probably in consequence of his illegitimate birth, that he was accidentally discovered by a shepherd, and placed under the care of Chiron. His death was said to have been caused by the jealousy of Pluto, in consequence of the number of individuals whom he rescued from the grave; from which tale we may at least conclude that his reputation, as a successful practitioner, must have been much higher than that of any of his contemporaries.‖

* *Haller*, Bibl. Med. pract. lib. i. §. 7, 8. *Hundertmark*, in Ackermann, Opuscula, Exerc. no. 1.

† *Herodotus*, Euterpe, passim. *Diodorus Siculus*, lib. i. passim. *Josephus*, Antiq. Jud. lib. viii. cap. 2. §. 5. Odyss. xix. 656 et seq. Æneis, vii. 753 et seq.

‡ Ilias, xi. 636 et seq. *Sprengel*, t. i. p. 112, 3. *Ackermann*, par. 1, cap. 3, §. 25–40.

◊ *Pausanias*, lib. i. cap. 21; ii. 10; ii. 13; iii. 22; iv. 31; vii. 21; vii. 23; vii. 27; viii. 25. *Strabo*, lib. viii. p. 592; ix. 668; xiii. 899; xvi. 1097, à Casaubon. Amst. 1707. *Le Clerc*, par. 1, liv. i. ch. 20.

‖ *Diodorus Siculus*, lib. iv. §. 71. *Hyginus*, fab. 49 et alibi. *Le Clerc*, par. i. liv. i. ch. 11–16

According to the custom of that age, he transmitted his profession to his sons Machaon and Podalirius, who accompanied the Greeks in the Trojan expedition, and are celebrated in various passages of the Iliad for their medical skill.* From the incidental mention that is made by Homer and the early Greek writers of the nature of the remedies that were employed by these individuals or their contemporaries, it will appear that their practice was principally surgical, and nearly confined to the treatment of wounds, and that, with respect to internal diseases, these were for the most part conceived to be the immediate infliction of the Deity, and were therefore abandoned as incurable, or at least were to be obviated only by charms and incantations, and that the arts of magic formed no inconsiderable part even of their surgical practice.†

The practice of medicine remained for a considerable time hereditary in the family of Æsculapius, and in a great measure confined to it. His descendants obtained the name of Asclepiadæ; they were the priests of his temples, and presided over and directed the rites and ceremonies.‡ These temples, indeed, became a species of hospitals, to which patients resorted from all quarters for the relief of the diseases with which they were affected. Under the direction of the priests of these temples they underwent a variety of ceremonies, the immediate effect of which must have been principally upon the imagination. Some, however, of the practices which were enjoined were of a dietetic nature, and were directly conducive to temperance and cleanliness; such as frequent ablution, and the abstaining from certain kinds of food. To these, if we add that the temples were generally erected in healthy situations, that the patients enjoyed rest and leisure, and that the mind was interested by a succession of new and pleasing impressions, we may suppose that they would be placed under circumstances not a little resembling those which are found so conducive to health by the invalids who frequent the medicinal springs and other analogous establishments of modern times.§

Although the accounts that have been transmitted to us respecting Æsculapius would lead us to conclude that he was a real personage, who actually possessed a greater degree of medical skill than any of his contemporaries, yet his whole history is so involved in fable and mystery, that it is impossible to obtain any correct idea of the details of his practice. It has been observed above that it was probably, in a great measure, surgical, and even confined almost exclusively to the cure of wounds or recent injuries. The treatment of these may be considered so far judicious as it was simple; it consisted in removing all extraneous bodies, in placing the parts as much as possible in their natural position, in fomentations and ablutions, and in the application of certain vegetables, which were supposed to be possessed of balsamic or styptic properties. Wine and other articles of a more stimulating nature were also used, while oleaginous substances were employed nearly with the same intention as in modern times, to defend the part from the air or other external agents, together with bandages and other means of mechanical support. We have no distinct evidence how far internal remedies were administered; for the most part they relied on magical arts and incantations, and although we have reason to believe that certain vegetable products were occasionally employed as internal remedies, we are scarcely able to discover what was the object of the practitioner, and we are frequently unable to ascertain what were the plants that were employed.‖

But scanty and imperfect as is our knowledge of the state of medicine in the age of Æsculapius, after his death and that of his sons Machaon and Podalirius we have a long period, extending even to several centuries, during which we have still less information respecting the history and progress of the science. We have

Ortelius, Capita Deor. lib. ii. in Gronovii Thes. Græc. t. vii. p. 278 et seq. *Montfaucon*, Antiq. v. i. book ii. ch. 1, 2. *Sprengel*, t. i. p. 119 et seq. *Ackermann*, par. 1, cap. 3, §. 41–59; and especially the second dissertation in his Opuscula, by *Grimius* and *Richter*.

* *Le Clerc*, par 1, liv. i. ch. 17. *Sprengel*, t. i. p. 127 et seq. *Goulin*, Encyc. Méth. Médecine, "Anciens Médecins." This article may be advantageously consulted on the subject of the Greek and Roman physicians.

† Ilias xi. 636 et seq. Odyss. xix. 456 et seq.

‡ *Sprengel*, t. i. p. 168 et seq.

§ *Le Clerc*, par i. liv. ii. ch. 2–6. *Schulz*, par. i. §.2, cap. 4. *Sprengel*, t. i. p. 153 et seq. *Cabanis*, p. 59, 60.

‖ *Celsus*, lib. i. *præf.* *Plinius*, lib. xxix. cap. 1. *Le Clerc*, par. i. liv. i. ch. 15. *Schulz*, p. i. § 2, ch. 4 *Sprengel*, §.2, ch. 4, 5. *Cabanis*, ch. 2, §.1.

not a single improvement of any importance recorded as having taken place during this long interval, nor have we the names of any individuals transmitted to us who were of sufficient eminence to be distinguished above their contemporaries. We learn that the practice of medicine was entirely confined to the Asclepiadæ, who were the guardians or superintendents of the temples that were erected in honour of Æsculapius. It may be inferred from the very scanty materials which we possess on the subject, consisting entirely of allusions or indirect accounts, scattered through the works of the older poets and historians, that they sedulously kept up the system of rites and ceremonies, which had been handed down to them from still more ancient practitioners, that they carefully preserved to themselves the sole management of the art over which they presided, and we cannot doubt made use of the influence which they acquired over the minds of their contemporaries for the purposes both of gain and of ambition.* But although we regard the general system of the priests of Æsculapius to be nothing more than a tissue of mystery and delusion, it is very probable that the ample opportunities which they possessed of witnessing the phenomena of disease in all its forms, might enable them to obtain much valuable information respecting the nature and tendency of the morbid actions of the body, and of the effects of certain agents upon them. Men possessed of superior talents and sagacity would naturally profit by these advantages, and we accordingly find that some of these temples acquired a high degree of celebrity, in consequence of the supposed skill of the priests that were attached to them. These opportunities of acquiring experience were much facilitated by a practice which generally prevailed among the patients, whenever they were cured of their diseases, of depositing in the temple a votive tablet, on which was inscribed a narrative of the case, including a statement of the symptoms of the disease, and the means adopted for its removal. The temples were thus converted, to a certain extent, into schools of medicine, and as these records were religiously preserved, they became the repositories of much important information, which must have gradually led to an improvement in the art. Of the numerous temples that were dedicated to Æsculapius, there were three which acquired peculiar celebrity, those of Cos, of Gnidos, and of Rhodes; we are informed that Hippocrates made great use of these records, and it has even been supposed that one of the treatises which is generally ascribed to him, "Coacæ Prænotiones," was composed from the records which he procured from the temple of Cos.

Some ancient inscriptions have been discovered by the researches of the learned antiquaries of the last century, which would appear to consist of memorials of this kind; and from these specimens we may form some idea of the nature of the information that would be conveyed by them. For the most part they state little more than the name of the disease, together with a very brief account of the means adopted for its relief, which in many cases depended entirely upon certain ceremonies, and in others upon the application of remedies, which, we may venture to assert, could have no physical operation.† Still, however, some experience of the nature and treatment of disease might have been conveyed by their means, and of this we may presume that an individual of a sagacious mind would have availed himself for the improvement of his art.

Among the few circumstances that are transmitted to us respecting the principles and practice of the Asclepiadæ, we are informed that the priests connected with the two rival establishments of Cos and Gnidos devoted their attention, in some measure, to different objects; those of the former assumed more of a philosophical cast, attempting to unite reasoning with experience, while the latter attached themselves solely to the observation and collection of mere matters of fact. Hence it would appear that a foundation was thus early laid for the two great sects of the Dogmatists and the Empirics, which long divided the medical world, and the influence of which is, even at this day, not altogether destroyed. I may remark, however, that the philosophy of the school of Cos, if it may be so called, was founded upon such totally incorrect principles, and upon so fallacious a basis, that little immediate benefit was derived from it, and that it was only useful so far as it might lead them to exercise their intellectual powers, and enable them to reason

* *Lucian*, in his "Philopseudes," gives an account of various medical superstitions which prevailed at a later period, many of which were probably transmitted from the empirics of antiquity. See Tooke's Trans. v. i. p. 87 et seq.

† *Gruter*, Corp. Inscrip. a Grævio, pl. 17 et alibi. *Ackermann*, Opuscula, Diss. 3, § 3, by *Hundertmark* and *Carpzov*.

more correctly on medical subjects. By the mode in which Hippocrates speaks of certain practices, such as bleeding and the administration of emetics, purgatives, and other analogous medicinal agents, we may infer that they were in common use among his contemporaries, and probably had been so for a long time before him. We may in some instances obtain a knowledge of the vegetable substances that were employed in these early ages, as well as of the individuals who introduced them into practice by the names which were afterward imposed upon them by the ancients. It must indeed be obvious that the indication derived from these names is far from being decisive, as applied to any particular case; but we derive a general inference from it as to the nature of the articles employed, while they serve to point out the persons who were supposed to have been the most eminent for their skill or their science.

Some centuries had elapsed, during which the practice of medicine continued altogether in the hands of the priesthood, and under their control had remained nearly stationary. It had been exercised, for the most part, for the purpose either of direct emolument, or for the still more selfish purpose of maintaining their influence over the minds of the people, when it began to be cultivated by a different description of persons, much more likely to produce a spirit of improvement, and from whom in reality it derived its first impulse. It was during the sixth century before the Christian era that the genuine principles of philosophy first made their appearance in Greece; and among the other topics which then became the subject of investigation, the powers and functions of the human body were examined with considerable attention. This led to an inquiry into the nature and cause of diseases, and to the means of their removal; and although a long period elapsed before much actual advance was made in the knowledge of pathology or of the practice of medicine, yet we observe the effect of a more correct mode of reasoning, and may perceive that the strongholds of mystery and superstition, although not destroyed, were at least in some degree weakened.*

The celebrated name of Pythagoras may be mentioned as the first of this class respecting whom we have any accurate information, and even his history is enveloped in much obscurity. We may, however, conclude with certainty that he devoted the greatest portion of a long life to the pursuit of natural knowledge; that he made many considerable advances in various departments of science, and among others in the knowledge of the structure and actions of the human frame. It has been supposed that he dissected the bodies of animals, and hence acquired a certain acquaintance with anatomy; and that he publicly taught what he knew on this subject to a large assembly of students, who came from all the civilized parts of Greece and Italy to Crotona, where he established his school. We are informed that, for the purpose of acquiring knowledge, he travelled into those countries which, previously to his time, were regarded as the depositories of knowledge, particularly Egypt, where he is said to have passed no less than twenty-two years, and probably also Chaldea and some parts of Eastern Asia. From what has been stated above, we may form some conception of the nature of the knowledge that he would obtain from these sources, and we may conclude that he must have been possessed of a very superior mind to have been capable of extricating himself from the trammels of superstition and bigotry, in which every thing connected with those countries was involved.†

We are scarcely able to determine in what degree he directly improved the practice of medicine; it is probable, however, that as he did not make it his profession, but studied it only in connection with the other branches of natural philosophy, the actual additions which he made to it were not considerable.‡ This we may also conclude to have been the case with many of his pupils, who were among the most justly celebrated philosophers of that and the succeeding age. They may all of them be regarded as belonging to the school of Pythagoras, inasmuch as they cultivated natural knowledge by means of observation, and even occasionally of a rude kind of experiment; and although none of them were exclusively devoted to the study of medicine, yet they gradually and indirectly contributed to its advancement, so as to prepare the way for one of those great and commanding

* *Sprengel*, § 3, ch. 1.

† *Diogenes Laertius*, lib. viii. cap. 1–50. *Cicero*, de Fin. v. 29. *Valer. Maximus*, viii. 7. *Ælianus*, Hist. Var. iv. 17. *Clemens Alexandrinus*, Stromat. lib. i. p. 354–7. *Fabricius*, Bibl. Græc. lib. ii. cap. 13. *Enfield*, vol. i. p. 422 et seq. *Ackermann*, Instit. Per. 2, cap. 4, 5; Opuscula, diss. 4, a *Kuhn*.

‡ *Sprengel*, t. i. p. 337 et seq.

geniuses who occasionally make their appearance, and by their intellectual ascendancy produce such important revolutions in the world of science: it is unnecessary to state that I here allude to Hippocrates.

During the interval from Pythagoras to Hippocrates there are few names that require any particular notice as improvers of medicine. Democritus* and Heraclitus† were among the most illustrious followers of Pythagoras, but they became famous rather from the ingenuity with which they supported their peculiar hypotheses than from the additions which they made to actual knowledge. They applied respectively their favourite doctrines of atoms and elements to explain the phenomena of disease, and even the operation of remedies; but, it is unnecessary to say, with little real advantage. The former of these philosophers, however, deserves honourable mention from the attention which he paid to the study of comparative anatomy; and it has been conjectured that he so far rose superior to the prejudices of his age as to venture upon the dissection of the human subject.

The name of Acron is mentioned by Pliny‡ as among the first who attempted, upon any general principles, to apply philosophical reasoning to the science of medicine; but we have scarcely any knowledge of his history or character, nor have we any memorials left of the principles which he adopted.§ We may also select the name of Herodicus as having been considered the inventor of what was styled gymnastic medicine,‖ which was regarded by the Greeks as a very important branch of the art. Schools for the practice of the gymnastic exercises were established in various parts of Greece, and were placed under the direction and superintendence of persons especially trained for the purpose, who took charge of the health of their pupils, and who appear to have undertaken the treatment both of the accidents which occasionally occurred in their establishments, and also, when necessary, of internal diseases. These gymnasiarchs, as they were styled, must in this way have acquired a certain degree of information respecting the nature of disease, and seem to have been considered as among the most skilful practitioners of the age in which they lived.¶

CHAPTER II.

An Account of the Opinions and Practice of Hippocrates and his Contemporaries—Remarks on the History and Education of Hippocrates—High Estimation in which he was held—Remarks on his Character and Acquirements—On his Works—Account of his Principles and Doctrines, his Physiology, Pathology, Anatomy, and Practice.

We now enter upon the history of an individual of very distinguished character and acquirements, who was destined to effect a complete revolution in his profession, and to introduce a system which may be considered as having laid a foundation for all its future improvements. The contemporaries and immediate successors of Hippocrates were so sensible of his merit, that he acquired from them the title, which he has since retained, of Father of Medicine; and it may be confidently affirmed that the science is more indebted to his genius and ability than to that of any single individual. It is a little remarkable that, notwithstanding the great celebrity which he attained, we have no very correct knowledge of his history, of the mode of his education, or of the means by which he acquired his wonderful pre-eminence. All that we are able to learn on these points with any degree of

* *Le Clerc*, p. 96–101. *Enfield*, vol. i. p. 422 et seq. *Barchusen*, diss. No. 1. *Sprengel*, t. i. p. 261–6.
† *Le Clerc*, p. 95, 96. *Sprengel*, t. i. p. 266–9. *Enfield*, vol. i. p. 436 et seq.
‡ Lib. xxix. cap. 1.
§ *Le Clerc*, par. i. liv. ii. ch. 7.
‖ *Le Clerc*, par. i. liv. ii. ch. 8. *Mercurialis*, De Arte Gymnastica. *Schulz*, p. 192 et seq. *Barbier*, Dict. Scien. Méd. art. "Gymnastique." *Ackermann*, per. 2, cap. 6.
¶ *Plato*, De Repub. passim, et De Leg. lib. vii. Schulz has judiciously summed up, in a series of general propositions, the history and progress of medicine up to the period at which we are now arrived, p. 201, 2.

certainty is, that he was brought up among the Asclepiadæ, who were attached to the temple of Cos; that he studied medicine under Herodicus, and that he embraced the philosophical hypothesis of Heraclitus: he is also reputed to have been a lineal descendant, in the eighteenth degree, from Æsculapius, and may therefore be supposed to have been devoted to the profession from an early period of life, and must have had access to all the records which were accumulated in the establishment to which he belonged. These circumstances may have had the effect of originally directing his mind to the pursuits in which he afterward became so eminent; but we must suppose that he possessed from nature a genius singularly adapted to the advancement of medical science, by which he was enabled so far to surpass all those who were placed in situations equally advantageous. We are informed that he spent a considerable portion of his life in travelling through foreign countries, partly for the purpose of obtaining information, and partly from the circumstance of his assistance being required to undertake the cure of persons of rank, to arrest the progress of epidemics, or to check the ravages of endemic diseases. The works that he left behind him are very numerous, and, considering their antiquity, they may be regarded as in a tolerably perfect state.

Unfortunately, however, to those which appear to have a just claim to be considered as his genuine productions there are appended a number of others, which it may be concluded are spurious, either written by his pupils or successors, or fraudulently attached to his name in consequence of his great celebrity. Many eminent critics have exercised their ingenuity in endeavouring to separate the genuine from the spurious writings of Hippocrates; and in such estimation was he held, that for many ages a main object with all writers on medical topics was to comment on the works of Hippocrates, to elucidate his principles by subsequent observation, or to support their respective doctrines by his authority. He is mentioned with great respect by Plato, Celsus, and Pliny, and by others among the ancients: Galen speaks of him with a degree of almost enthusiastic admiration; and at the revival of letters the most learned men of the times devoted themselves to the elucidation of his works by glossaries, commentaries, and criticisms of all descriptions. In Italy, Germany, and France, where learning first began to revive, and where the earliest universities were established, we have, among other illustrious names, those of Alpinus, Cornarius, Hollerius, Ballonius, Mercurialis, Fernel, Heurnius, Sennert, Fœsius, Riolan, and Duret,* who, however they might differ in their opinions and practice, all coincided in regarding Hippocrates with equal respect, and considered him as having first placed the study of medicine on its correct basis.†

We are hence naturally led to inquire what were the circumstances, in the intellectual or literary character of Hippocrates, which produced this powerful impression, and perhaps we may assign the following as among the most influential. He appears to have had the sagacity to discover the great and fundamental truth, that in medicine, probably even more than in any other science, the basis of all our knowledge is the accurate observation of actual phenomena, and that the correct generalization of these phenomena should be the sole foundation of all our reasoning. Every page of Hippocrates proves that he was not without his speculations and hypotheses, but at the same time we perceive that, for the most part, they were kept in subjection to the result of observation, and that, when they appeared to be in opposition to each other, he had the wisdom to prefer the latter. Hence his descriptions of particular diseases, after all the revolutions of customs and habits, both moral and physical, are still found to be correct representations of nature, while his indications of cure, and the treatment derived from them, are generally rational and practicable. When we reflect that at this period anatomy was scarcely practised,‡ that physiology was almost unknown, that the materia medica was nearly confined to vegetable substances, and of these to such as were indigenous to Greece and the neighbouring countries, our admiration of the skill and talents of Hippocrates will be still further increased, and we are induced to regard him as

* In designating the names of authors who flourished after the revival of letters, it is somewhat difficult to determine whether we ought to employ their actual or their latinized names: I have adopted the former where it could be done without ambiguity or the appearance of affectation.

† *Cowring*, Intr. cap. 3. §. 8. et alibi. *Haller*, Bibl. Med. Prac. lib. vi.; it is entitled "Schola Hippocratica," and is carried down to the beginning of the seventeenth century.

‡ *Gruner*, Analecta, diss. 2. "Hippocrates, corpora humana insecuerit necne?" He discusses the question with much learning and candour, and decides in the negative.

one of those rare geniuses, who so far outstrip their contemporaries as to form an era in the history of science.

With respect to the particular improvements which he introduced into the practice of medicine, I may remark, that one of the first importance was the narration of individual cases of disease,—a plan which may perhaps have been suggested to him by the votive tablets deposited in the temple of Æsculapius, but upon which he so far improved as to be entitled to the merit of an inventor. The second point on which I shall remark, was his method of endeavouring to remove particular symptoms by carefully noticing what have been termed the *juvantia* and the *lædentia*, watching the effect of his applications, and proceeding, by a cautious analogy, from individual facts to more general conclusions; and hence deducing his indications of cure from the operations of remedies, not from any preconceived or abstract principles, which were generally either fallacious or inapplicable. Hence his practice may be characterized as consisting in what has been termed a rational empiricism, where we first ascertain the fact, and afterward reason upon its consequences.

In speaking of the writings of Hippocrates, it may be proper to remark, that the most complete edition of them, in all respects, is that of Fœsius, in which every circumstance is attended to that can illustrate them or render them more easily intelligible. He has given a list of all the commentaries and criticisms that had been written upon them, which, at the time of his publication, in the year 1595, would of themselves have formed an extensive library. It appears from this list that no less than one hundred and thirty-seven authors had published on the subject of the aphorisms alone. It was remarked above that many of the writings which are commonly ascribed to Hippocrates, or at least are published in the collection of his works, are supposed not to have been his genuine productions; and hence it has been an object of interest with many eminent critics to distinguish the one from the other. It will not be necessary for me to enter into these discussions in this place; I shall only remark, that the number of treatises which are admitted to be certainly genuine is very small, compared to the whole number popularly ascribed to him. Of those which are printed in the ordinary editions of his works, which amount to more than sixty, Mercurialis, Haller, Gruner, and other critics, conceive that there are a few only which were actually written by Hippocrates, and Ackermann has even reduced the number of the genuine works to ten.*

In ascertaining what were the real opinions and practices of Hippocrates, besides the difficulty of discriminating the genuine from the spurious productions, we have a further difficulty arising from the peculiarity of his style. This is admitted to be brief and abrupt, and to be full of ideas, compared with the number of words employed to convey them; so that it appeared somewhat obscure even to his contemporaries and immediate successors. Erotianus, who lived in the first century of the Christian era, thought it necessary to write a glossary for the express purpose of elucidating his phraseology; and the immense number of commentaries which have appeared, and which continued to be published until the commencement of the eighteenth century, must be regarded, not only as a tribute to his extraordinary merit, but, in some measure, as an indirect censure of his style. But after making all due allowance for these peculiarities, after rejecting all the doubtful works and obscure passages, and resting more upon the general scope and tendency of the treatises than on particular words and phrases, we have sufficient evidence left us of the nature of his principles, both as regards theory and practice. Although it is principally in the latter capacity that we are now to regard Hippocrates, yet it will be proper to make a few remarks upon his acquirements in the analogous departments of science.

With respect to his philosophical tenets, it appears that the father of medicine must be classed generally among the Pythagoreans, and in the particular sect or school of Heraclitus. The leading doctrine of this philosopher was, that fire is the prime origin of all matter, and that by the collision and peculiar combination of its particles, which are in perpetual motion, the four elements are produced.† From

* *Conring*, cap. 3, §. 8. *Le Clerc*, par. 1, liv. iii. ch. 30. *Mercurialis*, Censura et Dispositio Operum Hippocratis. *Gruner*, Analecta, No. 2. *Kühn*, Bib. Med. p. 167–171, for the editions of Hippocrates. *Haller*, Bibliotheca Med. Prac. lib. i. §. 17–21. *Eloy*, Dict. hist. in loco. *Ackermann*, Inst. Hist. Med. par. 1, cap. 8, §. 102. *Blumenbach*, Introd. §. 34. *Goulin*, Enc. Méth. Médecine, "Hippocrate," p. 202–5.

† *Enfield*, b. 2, c. 14, v. 1, p. 436 et seq.

this doctrine Hippocrates derived his leading principles of pathology; it lies at the foundation of all his medical hypotheses, and is brought forward in various parts of his works. But although, like all his contemporaries, and indeed nearly all his successors up to the present day, he assumed certain theoretical principles; yet, as we remarked above, he had the extraordinary sagacity to perceive the necessity of detaching medicine from what was then styled philosophy. He professed to examine the phenomena of disease in the first instance, to ascertain what were the natural powers and properties of the animal frame, how far these were affected by external circumstances and by morbid causes, and hence to derive his curative indications and his mode of treatment. It is in the writings of Hippocrates that we observe the first traces of what is properly styled physiology, *i. e.* an account of the functions and powers of the living body. Although some of his opinions were derived from the school of Pythagoras, and savour of its mysticism and obscurity, yet others appear to have been original, and founded upon a much more correct and philosophical view of the subject. We owe to him the invention of the hypothesis of a principle, to which he gives the appellation of nature (φυσις), which influences all parts of the corporeal frame, superintends and directs its motions, and which is possessed of a kind of intelligence, so as to promote all the actions which are beneficial, and repress those which have an injurious tendency. In addition to this general principle, he conceives of others of a subordinate nature, which he styles powers (δυναμεις), which are more particularly concerned in the action of the various functions of the body. The body itself is supposed to consist of the four elements, combined in different proportions in different individuals, so as to produce an original difference in the constitution of the body, giving rise to the four temperaments. These influence both the intellectual and the corporeal part of our frame, and lay a foundation for disease independent of circumstances, and cause these circumstances to operate in different modes and in different degrees in different individuals.

One of the leading pathological doctrines of Hippocrates was, that the fluids are the primary seat of disease; a doctrine which, under the denomination of the Humoral Pathology, became the prevailing opinion of all sects and of all theorists, until the commencement of the eighteenth century. The combination of the four elements with the four states or qualities with which they were affected—of hot, cold, moist, and dry—gave rise to the four fluids or humours of the body—blood, phlegm, bile, and black bile,—which originally tended to produce the four temperaments, and which in their turn contributed to the excess or defect of each of the humours.

Another of the most important doctrines of Hippocrates is that of crises, or the natural tendency of diseases to a cure at certain stated periods, depending upon a natural train of actions, which, when proceeding in their due course, terminate in the removal of the morbid action. These supposed crises were, for the most part, evacuations of various kinds, especially by the bowels or the skin; and hence the regulation of these evacuations led to his most important indications, and became a main part of his practice. There is no subject on which Hippocrates showed more sagacity and accurate observation than in watching the effect of external agents upon the system,—such as temperature, the influence of the atmosphere, the effect of particular situations, of the seasons, and other analogous circumstances. In most of these cases the causes were obscure, and he frequently erred in his attempts to explain them; but his observations were correct, and contributed materially to the success of his practice.

The extent of knowledge which Hippocrates possessed on the subject of anatomy has given rise to much learned discussion. While his admirers were unwilling to admit that he was deficient in any of the departments of medical science, and attempted to prove that he had acquired a correct knowledge of the structure of the body, it has been contended, on the other hand, that on this point his information was very imperfect. This may be readily supposed to be the case from the abhorrence with which the dissection of the human subject was regarded at that period, and from the little attention which was paid even to comparative anatomy. There are likewise other considerations of an especial nature, which lead us to conclude that he had little knowledge of the internal structure of the body, or of the relation of its different parts to each other. Notwithstanding, therefore, the claim which has been set up for Hippocrates, by some of his devoted advocates, to a knowledge of the circulation of the blood, and other claims equally extravagant

and unfounded, we may conclude, with the learned and candid Le Clerc, that the knowledge which Hippocrates possessed of anatomy was little, if at all, superior to that of his contemporaries.*

After these brief observations on the theoretical doctrines of Hippocrates, and of the knowledge which he possessed in the various departments of medical science, we must conclude this chapter with a somewhat more minute account of his practice. Although he has published no regular treatise on practical medicine, nor laid down any specific rules on this subject, he has given us, in several parts of his works, a minute detail of his treatment of various diseases, so that we are enabled to ascertain, with considerable minuteness, the general principles on which he acted, as well as the mode in which he applied them. The great principle which directed all his indications was the supposed operation of "nature," to which we have referred above, in superintending and regulating all the actions of the system. The chief business of the physician is to watch these operations, to promote or suppress them according to circumstances, and perhaps, in some rare cases, to attempt to counteract them. The tendency of this mode of practice would be to produce extreme caution, or rather inertness, on the part of the practitioner, and we accordingly find that Hippocrates seldom attempted to cut short any morbid action, or to remove it by any decisive or vigorous treatment. Considering the state of knowledge on all subjects when he lived, it must be admitted that this plan of proceeding was much more salutary than the opposite extreme, and that it had likewise the good effect of enabling the practitioner to make himself better acquainted with the phenomena of disease, and, by observing the unaided efforts of nature, to form his indications with more correctness, and to determine to what object he ought more particularly to direct his attention. It has been remarked, that a man who is possessed of an acute and penetrating genius, however strongly he may be attached to a favourite hypothesis, contrives to adapt it to the information which he acquires; and this was in some measure the case with Hippocrates. For, notwithstanding the grand principle of the all-sufficient and unerring superintendence of nature, we have another general principle brought into view, which appears altogether of an opposite tendency, viz. that a disease is to be cured by inducing a contrary state of the system, or a contrary action in the morbid part. Thus, repletion is to be relieved by evacuation, and the effect of excessive evacuation to be removed by inducing repletion; the excess or defect of any of the humours or qualities is to be relieved by the employment of such means as may augment or diminish the contrary humour or quality. Perhaps it may be said that, in these cases, the practitioner is in fact only anticipating the operation of nature, or producing that change which would naturally ensue, were there not some unusual counteracting cause which prevented or repressed it. But it is of comparatively little consequence in what way he reconciled this apparent discordance; we have every reason to feel assured that this mode of treatment is frequently correct, and Hippocrates evinces the superiority of his genius by not suffering his judgment to be warped, even by the influence of a favourite hypothesis.

A third principle which very materially affected the practice of Hippocrates was the doctrine of critical evacuations, to which we have alluded above. As diseases were supposed to originate in the prevalence of some morbid humour, so when they are suffered to run their course without interruption, they are relieved by the discharge of the humour, and consequently the promotion of this discharge becomes an important indication, which it is often easy to accomplish, and which proves very effectual. Hence an important part of his practice consisted in the employment of evacuations of various kinds, and especially of purgatives, of which he used a great variety, and administered them with great freedom. This, indeed, was the only part of his practice which can be considered as decidedly active, but even here we do not perceive that he transgressed the limits of prudence, while in the selection of the remedy and its adaptation to each particular case, he manifested considerable judgment and sagacity. With the same intention he prescribed diuretics and sudorifics: he drew blood both by the lancet and the scarificator; he applied the cupping-glasses; he administered injections and inserted issues. He made very frequent use of external applications, such as ointments, plasters,

* *Le Clerc*, par 1, liv. iii. ch. 3. *Schulz*, per 1, sec. 3, cap. 2, §. 1–8. *Sprengel*, t. i. p. 302 et seq. *Grimm*, Analecta, No. 2. *Leuth*, liv. iii. passim.

liniments, &c., and was familiarly acquainted with the effects of external temperature. His materia medica was tolerably copious, and embraced many articles which still retain their place in our pharmacopœias. They were almost exclusively of vegetable origin, for the preparations which depend on chymical processes, such as metallic salts and oxides, the strong acids, with the spirituous compounds, were then totally unknown.

One important part of medical practice to which Hippocrates paid particular attention was the regulation of the diet; in this he displayed much sagacity and discernment, as well as on all points connected with the management of his patients, with regard both to the cure and prevention of disease. He appears to have been the first who noticed what has been called the epidemic constitution of the seasons, that inexplicable condition of the atmosphere, or of those influences to which the body is exposed, which appears to render it more or less obnoxious to certain morbid causes, and even to generate these causes at certain periods, without our being able to refer their production to any more general principle.

The tendency of the practice of Hippocrates to allow the operations of the system to pursue their course without interruption, united with his natural sagacity, enabled him to acquire great skill in prognostics, so that there are no parts of his writings which exhibit more decisive marks of a superior understanding than those in which he treats on this topic. Upon a review of the character and writings of this celebrated individual, we conceive that we are warranted in the conclusion, that while there are few persons of any age or nation who attained to greater distinction among their contemporaries, or whose memory has been more cherished by posterity, there was perhaps no one whose fame was more merited or established upon a firmer foundation.*

CHAPTER III.

History of Medicine from the Time of Hippocrates until its Introduction into Rome—Establishment of the Dogmatic Sect—Plato—Aristotle—School of Alexandria—Erasistratus—Herophilus—Division of Medicine into different Departments—Into the Dogmatic and Empiric Sects—Their General Principles.

We have not much to add respecting the state of medicine during the period which immediately succeeded to the death of Hippocrates. The advance which he made in the science, and the improvement which he introduced into the practice, were so considerable, that no one appeared for some centuries who was able to proceed, at least in any considerable degree, beyond the point of perfection to which it had been brought by the great father of medicine. In conformity with the custom of the times, Hippocrates transmitted his profession to his sons Thessalus and Draco, and we are informed that it continued to descend in the direct hereditary line for several successive generations. Polybus, his son-in-law, is singled out as having fully maintained the credit of his illustrious relative; and it is even said that many of the writings usually ascribed to Hippocrates are in reality the production of Polybus.†

The only other names which we meet with in the annals of medicine among the Asclepiadæ, that are in any considerable degree distinguished, are Diocles of Carystus and Praxagoras of Cos. The former of these obtained a high reputation for his learning and practical skill: he appears to have adopted for the most part the opinions and practice of Hippocrates.‡ Of the latter, although he is enumerated among the successful improvers of the art, we have only very imperfect and unsatisfactory accounts. We are indeed informed that he paid great attention to

* *Le Clerc*, par. i. liv. iii. *Conring*, cap. 2, §. 11, et alibi. *Schulz*, per. 1, §. 3, cap. 1–4. *Douglas*, Bibliogr. Anat. p. 1, et seq. *Barchusen*, diss. No. 12. *Haller*, Bib. Med. lib. i. §. 17–21. *Sprengel*, §. 3, chap. 3. *Enfield*, vol. 1, p. 442–4. *Aikin's* Gen. Biog. in loco. *Goulin*, Enc. Méth. "Médecine," in loco. *Cabanis*, ch. 2, §. 3. *Ackermann*, Inst. Hist. Med. p. 70–8. *Eloy*, Dict. in loco. Nouv. Dict. Hist. in loco. *Renauldin*, Biog. Univ. "Hippocrate."

† *Le Clerc*, par. i. liv. iv. ch. 1.

‡ *Le Clerc*, par. i. liv. iv. ch. 5. *Schulz*, p. ii. cap. 1, §. 10–22. *Sprengel*, t. i. p. 366

anatomy, that he particularly noticed the state of the pulse, and derived many of his indications from this source; but we have little except the general fact of the estimation in which his name was held by his contemporaries, which can enable us to form an estimate of his merit.* The name of Chrysippus may be noticed in this place as one who appears to have been a kind of irregular practitioner, as we should style him, who did not belong to the family of the Asclepiadæ, and was principally remarkable for the innovations which he introduced into practice.† But, like too many of those whose fame is principally founded on the novelty of their opinions, we do not find much to commend in them. We are told that he did not allow, in any case, of bleeding, and that he discountenanced the employment of all active purgatives; and, in short, that he rejected many of the most powerful and effective agents in the treatment of disease.‡

Draco and Thessalus, in conjunction with their relative Polybus, are generally regarded as the founders of what has been considered as the first medical sect or school which was established upon rational principles. It obtained the name of the Hippocratean, or more generally the Dogmatic school or sect, because it professed to set out with certain theoretical principles which were derived from the generalization of facts and observations, and to make these principles the basis of practice.

Although we can have no hesitation in pronouncing this to be the correct and legitimate method of pursuing the study of medicine, yet it must be acknowledged at the same time that it is a method which, if not carefully watched and strictly guarded by prudence and sagacity, is exposed to the greatest danger of being corrupted by ignorance and presumption. Hence we may easily conceive that it would be liable to fall into the grossest errors, and to lie open to the most serious imputations, and that a fair plea would always be found for exclaiming against the introduction of what is termed theory into the practice of medicine. This abuse of the principles of the Dogmatists gave rise to the rival sect of the Empirics, who, perceiving the false reasoning of the former, and the injudicious practice consequent upon it, professed to be guided altogether by experience, and to discard all theory. For many centuries, these two sects divided the medical world; and even at this day, after all the revolutions of opinion and the improvements of science we may observe very distinct traces of their influence. It was not, however, until a considerably later period that the Empirics formed themselves into a distinct sect, and became the declared opposers of the Dogmatists.§

Besides the individuals who belonged to the family of the Asclepiadæ, and who made medicine their particular profession or pursuit, most of the philosophers of Greece bestowed a certain degree of attention upon this science; for it appears that among the ancients a knowledge of medicine was regarded as one of the branches of philosophy which was included in a course of general education. The only two, however, of the Grecian philosophers whom it will be necessary to mention on the present occasion are Plato and Aristotle, who, although they did not compose any treatises on medicine, strictly so called, make frequent allusions to it in various parts of their writings. The former of these authors, in his dialogue styled Timæus and in his treatise De Republica, has entered into various physiological discussions respecting the functions of the body, and the supposed effect of their derangement in producing the morbid conditions of the system, and has offered various incidental observations on the practice of his contemporaries. But it does not appear that either the theory or the practice of medicine received any improvement from this philosopher. He made little or no addition to the actual stock of our knowledge in any branch of natural science, while his peculiar genius rather led him to the formation of hypotheses and speculations derived from fanciful analogies, tinged with that air of mystery which pervades most of his writings.‖

Both the original turn of mind and the pursuits of Aristotle were much better adapted to improve the science of medicine than those of Plato: he made very

* *Le Clerc*, par. i. liv. iv. ch. 6. *Schulz*, p. ii. cap. 1, §. 23–8. *Sprengel*, t. i. p. 372–4.

† Pliny remarks of him, "Horum (referring to previous physicians) placita Chrysippus ingenti garrulitate mutavit." Nat. Hist. lib. xxix. cap. 1.

‡ *Le Clerc*, par. ii. liv. i. ch. 1. *Schulz*, p. i. §. 3, ch. 5, 6. *Sprengel*, t. i. p. 365.

§ *Sprengel*, §. 4, ch. 1.

‖ *Le Clerc*, par. i. liv. iv. ch 3. *Stanley's* Hist. of Phil. part v. ch. 22, p. 79 et alibi. *Sprengel*, t. i. p. 337 et seq.

great advances in the knowledge of nature; he was peculiarly well situated for the acquisition of new information on all subjects connected with natural history, and he diligently availed himself of his advantages. He was the first writer who published any regular treatises on comparative anatomy and physiology, and his works on these subjects may be still read with much interest after all the additions which have been made to them by the moderns.* But notwithstanding all these favourable circumstances, it may be questioned whether the influence of Aristotle has not been ultimately somewhat unfavourable to the progress of knowledge. With his valuable facts and observations he mixed up a large portion of recondite and refined speculations, so that it is frequently not easy to separate the one from the other; and so great was the ascendancy which this genius acquired over the minds of men for many centuries after his death, that all his opinions, the most unfounded as well as the most philosophical, were indiscriminately received as established truths, which no one ventured to oppose or to controvert.†

The next circumstance which we are called upon to notice in the history of medicine is the establishment of the school of Alexandria. This was effected by the munificence of the Ptolemies, who, about three hundred years before the Christian era, laid the foundation of the celebrated Alexandrian library and of the school of philosophy which is graced by so many illustrious names. The science of medicine was cultivated in this school with peculiar assiduity, and we owe some very essential improvements to its professors. Among the most famous of these are Erasistratus and Herophilus. We have not much accurate information respecting the personal history of these two individuals, nor have any of their works been transmitted to us; but we have a detailed account of their opinions and practice given us by Galen, Cœlius Aurelianus, and others, so as to enable us to form a tolerably correct estimate of their merits. They are particularly mentioned as being the first who dissected the human subject, for which purpose the bodies of criminals were allotted to them by the government; and it appears that they amply profited by the advantage which was thus given them, so as very considerably to advance our knowledge of the structure of the body, especially by pointing out those circumstances in which the human subject differed from that of the animals who most nearly resembled it, and in correcting the errors on this point into which their predecessors had fallen. Nearly every part of the great system of which the body is composed profited by their labours: they ascertained with much more correctness than had been previously done the structure of the heart and great vessels, and of the brain and nerves, and they even seem to have had some imperfect knowledge of the absorbents. We are informed that Erasistratus was the pupil of Chrysippus, and that he imbibed from him his prejudice against bleeding and against the use of active remedies, trusting more to the operation of diet or the natural efforts of the system: hence we are to regard him as having improved the practice of medicine only indirectly by the addition which he made to our knowledge of anatomy.‡ The anatomical fame of Herophilus is so intimately blended with that of Erasistratus that we are unable to assign to each his respective share of merit; but it would appear that the former was more correct and more skilful in the practical department. Of this we have one proof in the fact which is stated by Galen, that Herophilus was one of the first who paid very minute attention to the varieties of the pulse; and his name is handed down to us by the ancients as entitled to the highest respect, both from his character and his acquirements.§

An important circumstance in the history of medicine, and more especially in that department to which our attention is particularly directed, occurred soon after the establishment of the Alexandrian school, viz. the division into distinct professions, which were exercised by different individuals. Previously to this period the practice of what is more especially styled medicine and of surgery was exercised by the same person; the ἰατρος of the Greeks corresponding nearly to what we

* *Douglas*, Bibliogr. Anat. p. 9–11.

† *Le Clerc*, par. i. liv. ii. ch. 4. *Schulz*, p. ii. cap. 1, §. 2 et seq.. *Stanley*, part vi. passim. *Sprengel*, §. 4, cap. 2.

‡ *Le Clerc*, par. ii. liv. i. ch. 2–4. *Schulz*, p. ii. cap. 3, §. 35–66. *Sprengel*, t. i. p. 439 et seq. *Lauth*, p. 140, 1.

§ *Le Clerc*, par. ii. liv. i. ch. 6. *Schulz*, p. ii. cap. 3, §. 2–34. *Sprengel*, t. i. p. 433 et seq. *Lauth*, p. 139, 140.—For an account of the Alexandrian school generally, see *Sprengel*, sect. 4, ch. 3; and *Lauth*, liv. iv.

should now term the general practitioner. But about this time the separation into the departments of dietetics, pharmacy, and surgery commenced, and was gradually admitted into all succeeding schools or sects. The terms did not, however, possess precisely the same signification as in modern times. Dietetics comprehended not the regulation of the diet alone, but every circumstance connected with the general health or management of the patient, and corresponded very nearly to the "medicus" or physician of modern times. The second included not merely the department of the apothecary or the compounder of drugs, but the performance of many of the operations of surgery; while to the third was allotted the treatment of surgical diseases, many of the operations, however, being committed to the professors of the second branch. That this separation eventually tended to the improvement of the respective branches of the profession will scarcely be doubted, although it must at the same time be acknowledged that many of the distinctions which were introduced were frivolous and invidious, and are now rapidly yielding to the superior intelligence of modern times.*

It was about this period, *i. e.* shortly after the establishment of the Alexandrian school, that the great schism, to which we have so often alluded, took place. It was occasioned by the formation of the rival sects of the Dogmatists and the Empirics. Neither of these terms, in the first instance, bore exactly the same meaning which they convey to a modern ear. The controversy really consisted in the question, how far we are to suffer theory to influence our practice. While the Dogmatists, or, as they were sometimes styled, the Rationalists, asserted that before attempting to treat any disease we ought to make ourselves fully acquainted with the nature and functions of the part which is affected, or rather of the body generally, with the operation of medical agents upon it, and with the changes which it undergoes when under the operation of any morbid cause; the Empirics, on the contrary, contended that this knowledge is impossible to be obtained, and, if possible, is not necessary;—that the minute and internal changes of the system, and of its different parts, are beyond the reach of our most acute observation, that it is alone essential to watch the phenomena of disease, and to discover what remedies are best fitted to relieve the morbid symptoms;—that our sole guide must be experience; and that, if we step beyond this, either as derived from our own experience or observation, or that of others on whose testimony we can rely, we are always liable to fall into dangerous and often fatal errors. We may remark that this controversy, like so many others which have occupied the attention of mankind for a succession of ages, is partly verbal, and in so far as it is not verbal, that it is a question of degree. The boldest Dogmatist professes to build his theory upon facts, and the strictest Empiric cannot combine his facts without some aid from theory. The uniform experience of all the schools and sects from the days of Hippocrates to the present time, demonstrates that the undue extension of either of these systems is injurious, that they both originate from a partial view of the subject, and may generally be traced to some defect either in the acquired information or natural disposition of the practitioner. The controversy, however, forms so prominent a feature in the history of medicine, that it will be necessary to advert to it very frequently in the following pages; and we shall find that in estimating the value of the various opinions or modes of practice which will successively pass under our review, it will in most cases be necessary to inquire from which of these sects they emanated.†

Respecting the individuals to whom the origin of these sects should be referred, there is some degree of obscurity: the Dogmatists generally claim Hippocrates for their founder, and it is certain that he investigated with great care the functions of the animal body, the action of morbid causes upon it, and the operation of remedies, or, as we should style them, the general principles of pathology and therapeutics. But while in this respect he acted upon the principles of the Dogmatists, he was no less remarkable for the accuracy with which he observed the phenomena of disease, and the actual operation of remedies upon individual cases, or even upon particular symptoms; and it may be affirmed, that in most instances, when his preconceived hypothesis seemed to be in contradiction to the results of his experience, he wisely followed the latter. We may, however, easily imagine

* *Celsus*, lib. i. pr f. *Schulz*, p. ii. cap. 5. *Le Clerc*, par. i. liv. ii. ch. 9. *Eloy*, "Partage de la Médecine."

† For an elegant summary of the arguments employed in this controversy, the reader is referred to *Percival's* Essays, nos. 1 and 2.

that his successors, not being possessed of his sagacity and industry, would prefer the easier method of indiscriminately adopting all his principles and speculations, to the more arduous task of correcting or extending them by their own observation, and that they would in this way bring all theoretical reasoning into disrepute. It is more probable that this feeling would be gradually induced in the minds of practitioners, than that it would be at once announced by any single individual: and as a matter of historical fact, the ancients themselves were divided in their opinion as to the person to whom they should ascribe the origin of the empirical sect. Pliny attributes it to Acron, a physician of Sicily,* who was contemporary, if not prior to Hippocrates; while Celsus states that Serapion of Alexandria, who was said to be a pupil of Herophilus, was the first who distinctly professed the opinion that theory is to be totally discarded in medicine, and that direct experience should be our sole guide.† We have little correct information respecting either the history or the practice of Serapion; none of his writings have been transmitted to us, but from the scattered notices which we meet with concerning him, dispersed through the works of the ancients, it may be conjectured that he was a man of considerable acuteness and sagacity, and that he generally adopted the practice of Hippocrates and his school, although he discarded their theory.‡

All the medical men of the period at which we are now arrived, and for some centuries subsequent to it, were attached to one or other of these rival sects, and, it would appear, in nearly an equal proportion. Unfortunately, however, for the Empirics, it has happened that all their writings have perished, so that we are obliged to form our opinion of their merits principally from the representation of their antagonists. There is, indeed, one happy exception in the works of Celsus, who, in the commencement of his treatise, has given an account of the leading opinions of the two opposing sects, in so candid and judicious a manner as almost to supersede any more elaborate discussion. It has been thought by many that the view which Celsus gives of the controversy is too favourable to the Empirics; and we admit that we can scarcely read his account without being impressed with the opinion, that he advocates their side of the question. Yet the conclusion which he draws is perfectly candid, and is, indeed, not very remote from what the most enlightened practitioner would form at the present day;—that the perfect rule of practice is derived from a due combination of reason and experience; that without experience all preconceived theory would be vain and useless; and that by simple experience, without any attempt at generalization, we should frequently fall into gross errors, and be unable to profit even by the very experience which is so much extolled. And, indeed, whatever may have been the professed plan of the supporters of the two sects, we shall always find that the practice of the most eminent of either party actually proceeded upon a judicious combination of the two systems; and we are now persuaded that it is upon such a combination that all further improvements of the science and practice of medicine must essentially depend.§

* Lib. xxix. cap. 1. † In præf. sub initio.
‡ *Schulz*, per. ii. cap. iv. §. 8 et seq.
§ *Galen*, de Subfigurat. Empir. et alibi. *Celsus*, in præf. *Barchusen*, Diss. nos. 10 & 13. *Le Clerc* par ii. liv. ii. *Schulz*, per. ii. cap. iv. *Sprengel*, §. 4. ch. 1, 4. *Ackermann*, p. iii. cap. 10–13.

CHAPTER IV.

On the State of Medicine among the Romans from its first Introduction into Rome until the Time of Galen—Roman Superstitions—Archagathus—Cato—Asclepiades—Themison—Origin of the Methodic Sect—Thessalus—Soranus—C. Aurelianus—Doctrines of the Methodics—Pneumatics and Eclectics—Aretæus—Archigenes—Celsus, his Doctrines and Practice—Condition of Physicians in Rome—Pliny—Dioscorides.*

For some centuries the school of Alexandria produced a succession of learned men, not only in medicine but in the other sciences, and contributed to the advancement of knowledge, or at least prevented the decay into which it was in danger of falling after the decline of the Grecian literature. It was during this period that the foundation was laid of the future grandeur of the Roman empire; but from the attention of this people being almost exclusively directed to warlike affairs, and perhaps also from other causes, science of all kinds, and medicine among the rest, was for a long time almost totally neglected. Rome had extended her empire far beyond the limits of Italy, and had subdued most of her rivals, before she condescended even to tolerate the pursuit of the arts and sciences. We are expressly told by Pliny, that for six hundred years she was without physicians. We cannot conceive it possible that during this long period no attempts were made to remove diseases; we can only understand by it that there were no individuals eminent for their knowledge or skill who were engaged in the profession, or perhaps that it was scarcely regarded as the object of distinct pursuit, or that individuals were not especially trained to the exercise of it. We have, indeed, abundant evidence of two circumstances; that in this, as in every other subject connected with the arts of life, the Romans servilely copied from the Greeks,† and that, as far as their medicine was concerned, wherever they deviated from them it was for the purpose of adopting various superstitious rites and ceremonies, indicating the most profound ignorance and the grossest superstition. Numerous instances of this kind are incidentally mentioned by Livy; and although he wrote in the refined age and splendid court of Augustus, they are introduced in the thread of his narrative as actual transactions, without any observation indicative of his disbelief of their efficacy.‡ One of these is the account which he gives us of the introduction of the worship of Æsculapius into Rome. In consequence of a fatal epidemic, the senate had recourse to the usual expedient of consulting the Sibylline books, where it was found to be enjoined upon them to transfer the worship of the god from Greece to their city. A formal deputation was accordingly despatched for the purpose, by whom the deity, unwilling to leave his native place, was seized by a stratagem, and was conveyed under the form of a serpent into Italy. He was received by the people of Rome with unbounded transport; a temple was erected to him on an island in the Tiber; the usual appendages of priests, with all their ceremonies, were appointed; and the plague was of course suspended.§

Pliny further informs us that medicine was introduced into Rome at a later period than most of the other arts and sciences; that the practice of it had even been expressly prohibited by the citizens, and its professors banished. The

* For a concise, and at the same time a comprehensive, view of this period of the history of medicine, the reader is referred to the fifth section of Blumenbach's Introduction. I may further remark that this work may be consulted with advantage, in connection with almost all the names that pass in succession under our review.

† *Suetonius*, de Grammat. sub initio; the fact is admitted by Cicero and by Pliny, and is frequently alluded to in various parts of their writings.

‡ The following references may be selected among many others of a similar kind:—Book i. ch. 31, Tullus consults the Sibylline books in order to stop the plague;—iv. 25, for the same purpose a temple is erected to Apollo;—v. 13, the books were again consulted;—vii. 2, a lectisternium was ordered for the same purpose, and afterward the public games;—vii. 3, the plague was stopped by the dictator driving a nail.

§ *Livius*, lib. x. cap. 47, et epitome ad lib. xi. *Val. Maximus*, lib. i. cap. 8. §. 2. *Schulz*, p. ii. cap. 6. §. 4 et seq. *Montfaucon*, Antiq. Suppl. v. i. b. v. ch. 1. *Lucianus*, Tooke's Trans. v. i. p. 635, note.

account which he gives of so singular an occurrence is, that about two hundred years before Christ, Archagathus, a Peloponnesian, settled at Rome as a practitioner of medicine, and, as it may be inferred, was the first person who made it a distinct profession. He was received in the first instance with great respect, and was even maintained at the public expense; but his practice was observed to be so severe and unsuccessful, that he soon excited the dislike of the people at large and produced a complete disgust to the profession generally, which led to the transaction mentioned above.* His practice seems to have been almost exclusively surgical, and to have consisted, in a great measure, in the use of the knife and of powerful caustic applications. We hear little more of the state of medicine in Rome for the next century; but from certain incidental observations we may infer that it remained principally in the hands of the priests, and consisted as before in superstitious rites and ceremonies. It appears, indeed, that the few individuals who devoted themselves to the cultivation of natural science, among other subjects directed their attention to medicine; and it is particularly stated that Cato introduced various articles into the materia medica, and wrote several treatises on medical topics. We are not able to form any just conception of their merit from the account which is given of them; but it is worthy of remark that he was a professed opponent to Grecian literature in general, and we may therefore conclude, would not avail himself of the improvements that had been made by the Greek physicians.†

We may presume that the prejudice which was excited against Archagathus would be gradually allayed, and that the improvement of the Romans in intellectual cultivation, although not considerable, would be at least sufficient to make them sensible of the necessity of attempting something beyond the mere power of charms and incantations for the removal of disease. Accordingly, about a century before the Christian era, we find that another individual had acquired a very considerable degree of popularity at Rome, which he maintained through life and in a certain degree transmitted to his successors,—Asclepiades of Bithynia. It is said that he first came to Rome as a teacher of rhetoric, and that it was in consequence of his not being successful in his profession that he turned his attention to the study of medicine. From what we learn of his history and of his practice, it would appear that he may be fairly characterized as a man of natural talents, acquainted with human nature, or rather with human weakness, and possessed of considerable shrewdness and address, but with little science or professional skill. He began upon the plan which is so generally found successful by those who are conscious of their own ignorance, of vilifying the principles and practice of his predecessors, and of asserting that he had discovered a more compendious and effective mode of treating diseases than had been before known to the world. As he was ignorant of anatomy and pathology, he decried the labours of those who sought to investigate the structure of the body, or to watch the phenomena of disease, and he is said to have directed his attacks more particularly against the writings of Hippocrates. It appears, however, that he had the discretion to refrain from the use of very active and powerful remedies, and to trust principally to the efficacy of diet, exercise, bathing, and other circumstances of this nature. A part of the great popularity which he enjoyed depended upon his prescribing the liberal use of wine to his patients, and upon his attending in all cases, with great assiduity, not only to every thing which contributed to their comfort, but that he flattered their prejudices and indulged their inclinations. By the due application of these means, and from the state of the people among whom he practised, we may, without much difficulty, account for the great eminence to which he arrived, and we cannot fail to recognise in Asclepiades the prototype of more than one popular physician of modern times.

Justice, however, obliges us to admit that he seems to have been possessed of a considerable share of acuteness and discernment, which on some occasions he employed with advantage. It is said that to him we are indebted, in the first instance, for the arrangement of diseases into the two great classes of acute and chronic, a division which has a real foundation in nature, and which still forms an important feature in the most improved modern nosology. In his philosophical principles Asclepiades is said to have been a follower of Epicurus, and to have adopted

* Lib. xxix. cap. 1.
† *Le Clerc*, par. ii. liv. iii. ch. 1. *Schulz*, p. ii. cap. 6. *Ackermann*, p. iv. cap. 15.

his doctrine of atoms and pores, on which he attempted to build a new theory of disease, by supposing that all morbid action might be reduced into obstruction of the pores and irregular distribution of the atoms. This theory he accommodated to his division of diseases,—the acute being supposed to depend essentially upon a constriction of the pores, or an obstruction of them by a superfluity of atoms; the chronic, upon a relaxation of the pores or a deficiency of the atoms.*

Asclepiades was succeeded in his professional reputation by his pupil Themison of Laodicea, who had the honour of founding a new sect in medicine, which for some time almost eclipsed the former rivals; this was the Methodic sect. The great object of Themison seems to have been to adopt a middle course between the Dogmatists and the Empirics, and to take advantage of the excellences of each of them. He was, however, strongly impressed with the great principles of Asclepiades, the importance of reducing the science to a few general laws, which by their simplicity might be universally intelligible and of easy application. He therefore rejected all the abstruse and recondite speculations of the Dogmatists, and substituted in their place a few positions derived from the tenets of his master, and founded upon the Epicurean doctrines. He remarks that it is an essential part of the business of the practitioner to make himself acquainted with the nature of the human frame, with its laws while in the state of health, and with the changes which they experience from disease. All these he referred to the respective states of constriction and relaxation, and to the undue preponderance of one of them over the other. To these two, however, he added a third, or mixed state, as he styled it, the nature of which is not very easy to understand; while by classing all medical agents under the two great divisions of astringents and relaxants, we learn how to apply the appropriate remedy for every disease.

Themison's doctrine must be regarded as a refinement, and certainly an improvement of that of Asclepiades; for although we have the states of constriction and relaxation professedly copied from his master, it is disencumbered of the more objectionable speculation of the atoms and pores. The theory of the Methodics contemplates the solids as the seat and cause of disease, in which respect it is directly opposed to that of Hippocrates, who traced the primary cause of disease to an affection of the fluids, giving rise to what has been termed the Humoral Pathology. The humoral pathology was zealously defended by Galen, and was universally adopted by his successors until the seventeenth century, when the opposite doctrine of Solidism was revived, and has been gaining ground until the present day. It has been justly objected to Themison's theory, that even if we admit the correctness of his views respecting the states of constriction and relaxation of the system, there is a palpable absurdity in supposing that they can be co-existent in what he terms his middle state, as they are directly opposed to each other.

There is no work of Themison's extant, but we have an ample account of his practice in the writings of Cælius Aurelianus, who was a zealous defender of the tenets of the Methodic sect. They appear to have been diligent in the observation of the phenomena of disease, and sagacious in their employment of remedies: they seem, indeed, to have sustained their character, of keeping a middle course between the Dogmatists and Empirics, avoiding the extremes of either, and combining the more useful parts of each system in a greater degree than had been done by their predecessors.†

For some time after the death of Themison the opinions of the Methodics were generally adopted in Rome, and almost superseded those of the professed Dogmatists and Empirics, so that we shall have little to detain us in our progress, except to notice certain individuals who became remarkable from their personal history or character, or from some peculiarity in their opinions or practice. The first of this description in point of time is Thessalus, who lived about half a century after Themison, and who ranks as one of his followers. He was, however, an individual very different, both in character and in acquirements, from his master. He is stated to have been of mean birth and of defective education, but, by cun-

* *Plinius*, passim. *Celsus*, ubi supra et alibi. *Le Clerc*, par. ii. liv. iii. ch. 4–9. *Sprengel*, sect. 5. ch. 1. *Cabanis*, ch. 2. §. 5. *Goulin*, Encyc. Méth., Médecine, "Asclépiade." *Chaussier et Adelon*, in Biog. Univ., "Asclépiade."

† *Celsus*, in præf. *Le Clerc*, p. ii. liv. iv. sect. 1. ch. 1 *Barchusen*, Diss. 11. *Sprengel*, t. ii. p. 20–3. *Ackermann*, per. iv. ch. 17.

ning and artifice, to have acquired great wealth and a high reputation. He began his career, in the usual mode of ignorance and self-sufficiency, by endeavouring to throw contempt on all his predecessors and contemporaries, by pretending to expose their errors, and by claiming to himself the discovery of a new theory of medicine which should lead to more correct practice, and should supersede all further attempts of the kind; in fine, he assumed to himself the pompous title of the conqueror of physicians (ιατρονικες).*

We shall not have occasion to dwell long upon one who is so unworthy of a place in the records of science; it is only necessary to remark concerning him, that he appears to have united the speculations of Asclepiades with those of Themison, and to have admitted the atoms and pores of the one, with the constriction and relaxation of the other. The only addition which Thessalus made to medical theory which deserves our notice, is the introduction of what he terms metasyncrasis, or the method of producing an entire change in the state of the body. This he opposed to the practice of Hippocrates, who professed to watch over and regulate the actions of the system, as well as to that of the Empirics, whose aim was to correct specific morbid actions, or to remove particular morbid symptoms. The term, as conveying a conceivable if not an actual occurrence, was not without its value, and was generally adopted by medical writers; and even in the present day the principle implied in it serves as the foundation for some of our most important indications.†

The name of Soranus next occurs among the celebrated Roman practitioners. There is, indeed, some reason for supposing that there were no less than three physicians of this name, but the one who is most eminent appears to have been a native of Ephesus, to have studied at Alexandria, and finally to have settled in Rome. He was a strict Methodic, and is said to have been highly respected for his character and talents. His writings have not been transmitted to us, but probably the most valuable information which they contain is handed down to us by C. Aurelianus, whose work, if not, as some have supposed, a translation of Soranus's treatise, proceeds upon the same principles, and inculcates the same practice.‡

There is considerable uncertainty respecting both the age and country of C. Aurelianus. Some writers place him as early as the first century of the Christian era, while others endeavour to prove that he was at least a century later. This opinion is principally founded upon the circumstance of his not mentioning or being mentioned by Galen, indicating that they were contemporaries or rivals. Numidia has been generally assigned as his native country, but perhaps without any direct evidence; it may, however, be concluded from the imperfection of his style, and the incorrectness of some of the terms which he employs, that he was not a native either of Greece or of Italy. But whatever doubts may attach to his personal history, and whatever defects exist in his writings, they afford us much valuable information respecting the state of medical science. He was a professed and zealous Methodic, and it is principally from his work that we are able to obtain a correct view of the principles and practice of this sect. In his descriptions of the phenomena of disease he displays considerable accuracy of observation and diagnostic sagacity; and he describes some diseases which are not to be met with in any other ancient author. He gives us a very ample and minute detail of the practice which was adopted both by himself and his contemporaries; and it must be acknowledged that on these points his remarks display a competent knowledge of his subject, united to a clear and comprehensive judgment.

He divides diseases into the two great classes of acute and chronic, nearly corresponding to diseases of constriction and of relaxation, and upon these supposed states he founds his primary indications; but with respect to the intimate nature of these states of the system, as well as of all hidden or recondite causes generally, he thinks it unnecessary to inquire, provided we can recognise their existence, and can discover the means of removing them. Hence his writings are less theoretical and more decidedly practical than those of any other author of an-

* *Plinius*, lib. xxix. cap. 1.—We have an amusing, and probably a correct, account given us by Lucian, of the successful knavery practised by an impostor of his age, named Alexander; see Tooke's Trans., v. i. p. 630 et seq. He appears to have been a worthy successor of Thessalus, so far as respects his arrogance and presumption.

† *Le Clerc*, p. ii. liv. iv. sect. 1, ch. 2, 3. *Sprengel*, t. ii. p. 28–31.

‡ *Le Clerc*, par. ii. liv. sect. 1, ch. 4. *Sprengel*, t. ii. p. 33–5.

tiquity; and they consequently contributed more to the advancement of the knowledge and actual treatment of disease than any that had preceded them. They contributed in an especial manner to perfect the knowledge of therapeutics, by ascertaining with precision the proper indications of cure, with the means best adapted for fulfilling them. The great defect of C. Aurelianus, a defect which was inherent in the sect to which he belonged, was that of placing too much dependence upon the twofold division of diseases, and not sufficiently attending to the minute shades by which they gradually run into each other; a defect the more remarkable in one who shows so much attention to the phenomena of disease, and who, for the most part, allows himself to be so little warped by preconceived hypothesis. This view of the subject leads him not unfrequently to reject active and decisive remedies, when he could not reconcile their operation to his supposed indications; so that, although his practice is seldom what can be styled bad, it is occasionally defective.

There were two points in which C. Aurelianus, and the Methodics generally, decidedly opposed the doctrines and practice of the followers of Hippocrates, in trusting the removal of disease to the restorative powers of nature, and in attributing diseases to the excess or defect of particular humours. With respect to the former point, they conceived that it was as frequently necessary to oppose as to promote the natural actions of the system; and with respect to the latter, they did not admit the existence of the supposed four humours; and even, if their existence could be proved, they did not conceive that they were in possession of the means of acting upon them individually or specifically.

In the treatment of acute diseases, or those of constriction, the cure was effected by topical bleeding (for general bleeding was rarely admitted), and by narcotic and oleaginous applications, aided by a pure and sometimes by a moist air. Abstinence was strictly enjoined, and indeed often carried to an undue length; and in the administration of all remedies the practitioner was frequently guided by critical periods, generally of three, or in other cases of seven days. When the ordinary means of cure were found not to be successful, or when any circumstance occurred which appeared to contra-indicate their application, C. Aurelianus had recourse to a preparatory system. This consisted principally in certain regulations regarding diet and exercise, in the use of the bath, frictions, and other external applications; when the system was thus prepared, the ordinary plan of treatment was had recourse to. Inflammatory diseases were supposed to depend upon constriction; abstinence, rest, and friction were enjoined in the first instance; bleeding, general or local, baths, and certain vegetable preparations were then administered, while purgatives seem to have been seldom if ever employed. Little regard appears to have been paid to particular symptoms, and upon the whole we should be disposed to consider the practice as deficient in promptness and vigour, and not very unlike that which prevails at this day in many parts of the Continent. We have mentioned above that C. Aurelianus seldom employed purgatives,—an unfortunate prejudice, by which he deprived himself of one of the most useful agents in the cure of disease; he also generally condemns the use of what are termed specifics,—an error, if it be one, much more venial; he very sparingly employs diuretics, condemns narcotics, and rejects caustics and all similar applications.*

Although the Methodic sect continued to prevail among the Roman physicians during the greatest part of the first two centuries of the Christian era, some alteration in the original tenets of Themison were gradually introduced, and it at length became subdivided into several minor sects or schools, which, although agreeing in certain fundamental principles, had each their peculiar views, which led to their separation from the main body, and to the adoption of specific appellations. Two of these were of sufficient notoriety to require being individually mentioned in this sketch,—the Pneumatics, and the Eclectics or Episynthetics.

The Pneumatics rose into notice about half a century after the death of Themison. They derive their appellation from the circumstance of their having introduced into their pathology the agency of what is termed the spirits (πνευμα), which, together with the solids and fluids, compose the corporeal frame. It would be somewhat difficult to state, in a few words, to what supposed substance or power

* Vide Opus, de Morb. Acut et Chron. *Le Clerc*, par. ii. liv. iv. sect. 1, ch. 5–11; we have in this author a very ample account of the principles and practice of the Methodics. *Barchusen*, Diss. 11, §. 5. *Haller*, Bib. Med. §. 72. *Sprengel*, t. ii. p. 37 et seq. *Eloy*, in loco. Biog. Univ. in loco.

the term was applied; we may observe in it some traces of the pneumatic physiology of the modern chymists, while in some of its agencies it resembles the nervous influence. This sect has acquired considerable celebrity from the name of an eminent medical writer, which has been generally attached to it, that of Aretæus.

There is some uncertainty respecting both the age and the country of Aretæus; but it seems probable that he practised in the reign of Vespasian, and he is usually styled the Cappadocian. He wrote a general treatise on diseases, which is still extant, and is certainly one of the most valuable reliques of antiquity, displaying great accuracy in the detail of symptoms, and in seizing the diagnostic character of diseases. In his practice he follows, for the most part, the method of Hippocrates, but he paid less attention to what have been styled the natural actions of the system; and, contrary to the practice of the father of medicine, he did not hesitate to attempt to counteract them, when they appeared to him to be injurious. The account which he gives of his treatment of various diseases indicates a simple and sagacious system, and one of more energy than that of the professed Methodics. Thus he freely administered active purgatives; he did not object to narcotics; he was much less averse to bleeding; and upon the whole his materia medica was both ample and efficient. It may be asserted generally, that there are few of the ancient physicians, since the time of Hippocrates, who appear to have been less biased by attachment to any peculiar set of opinions, and whose account of the phenomena and treatment of disease has better stood the test of subsequent experience. We have placed Aretæus among the Pneumatics, because he maintained the doctrines which are peculiar to this sect, and because he is generally considered as such by most systematic writers, although perhaps, strictly speaking, he is better entitled to be placed with the Eclectics.*

Of the sect of the Eclectics we know little except through the medium of the writings of their opponents. The most celebrated of them was Archigenes of Appamea, who practised at Rome in the time of Trajan, and enjoyed a very high reputation for his professional skill. He is, however, reprobated as having been fond of introducing new and obscure terms into the science, and having attempted to give to medical writings a dialectic form, which produced rather the appearance than the reality of accuracy. Archigenes published a treatise on the pulse, on which Galen has written a commentary; it appears to have contained a number of minute and subtile distinctions, many of which we may venture to affirm have no real existence, and to have been, for the most part, the result rather of a preconceived hypothesis than of actual observation; and the same remark may be applied to an arrangement which he proposed of fevers. He, however, not only enjoyed a considerable degree of the public confidence during his lifetime, but left behind him a number of disciples, who for many years maintained a respectable rank in their profession.†

It may appear singular that we have so many instances of individuals who have risen to great eminence, both from their professional skill and general science, but of whose private history we possess so little information. This is very remarkably the case with Celsus. We know little of his age, his origin, or even of his actual profession. There are some incidental expressions which lead to the conjecture that he lived under the reigns of Augustus and Tiberius, and particularly the mode in which he refers to Themison would indicate that they were either contemporaries, or that Themison preceded him by a short period only. With respect to the country of Celsus we have nothing on which to ground our opinion, except the purity of his style, which at most would prove no more than that he had been educated, and passed a considerable part of his life at Rome.

With regard to his profession, it has been doubted whether he was a practitioner of medicine, or whether he only studied it as a branch of general science after the manner of some of the ancient Greek philosophers. This doubt has arisen principally from the mode in which he is referred to by Columella‡ and by Quintilian,§ and by his not being enumerated by Pliny among the physicians of Rome in his

* *Le Clerc*, par. ii. liv. iv. sect. 1, ch. 2–3. *Barchusen*, Diss. 15, p. 232 et seq. *Haller*, Bib. Med. §. 64 *Eloy*, in loco. *Goulin*, Encyc. Méthod. Médecine, t. iii. p. 385 et seq. *Sprengel*, t. ii. p. 82–7. *Chaussier et Adelon*, Biog. Univ. "Aretée."

† *Le Clerc*, par. ii. liv. iv. sect. 2, ch. i. *Barchusen*, Diss. 15, p. 240 et seq. *Sprengel*, t. ii. p. 75–82.

‡ De Re Rust. lib. vi. cap. 5 § Lib. xii. cap. 11.

sketch of the history of medicine. Yet, on the other hand, it appears to me that his work bears very strong evidence that he was an actual practitioner, that he was familiar with the phenomena of disease and the operation of remedies, and that he described and recommended what fell under his own observation, and was sanctioned by his own experience; so that I conceive it, upon the whole, most probable that he was a physician by profession, but who devoted part of his time and attention to the cultivation of literature and general science.

The treatise of Celsus "On Medicine" is divided into eight books. It commences by a judicious sketch of the history of medicine, terminating by the comparison of the two rival sects, the Dogmatists and the Empirics, which has been referred to above. The two next books are principally occupied by the consideration of diet, and the general principles of therapeutics and pathology: the remaining books are devoted to the consideration of particular diseases and their treatment, the third and fourth to internal diseases, the fifth and sixth to external diseases and to pharmaceutical preparations, and the two last to those diseases which more particularly belong to surgery. In the treatment of disease, he for the most part pursues the method of Asclepiades; he is not, however, servilely attached to him, and never hesitates to adopt any practice or opinion, however contrary to his, which he conceived to be sanctioned by direct experience. He adopted, to a certain extent, the Hippocratean method of observing and watching over the operations of nature, and rather regulating than opposing them, a method which, with respect to acute diseases, may frequently appear inert. But there are occasions on which he displays considerable decision and boldness, and particularly in the use of the lancet, which he employed with more freedom than any of his predecessors. His regulations for the employment of bloodletting and of purgatives are laid down with minuteness and precision; and although he was, in some measure, led astray by his hypothesis of the crudity and concoction of the humours, the rules which he prescribed were not very different from those which were generally adopted in the commencement of the present century. His description of the symptoms of fever, and of the different varieties which it assumes, either from the nature of the epidemic, or from the circumstances under which it takes place, are correct and judicious; his practice was founded upon the principle so often referred to, of watching the operations of nature, conceiving that fever consists essentially in an effort of the constitution to throw off some morbid cause, and that, if not unduly interfered with, the process would terminate in a state of health. We here see the germ of the doctrine of the *vis medicatix naturæ*, which has had so much influence over the practice of the most enlightened physicians of modern times, and which, although erroneous, has perhaps led to a less hazardous practice than the hypotheses which have been substituted in its room.

But perhaps the most curious and interesting parts of the work of Celsus are those which treat of surgery and surgical operations. It is very remarkable that he is almost the first writer who professedly treats on these topics, and yet his descriptions of the diseases and of their treatment prove that the art had attained to a very considerable degree of perfection. Many of what are termed the capital operations seem to have been well understood and frequently practised, and we may safely assert, that the state of surgery, at the time when Celsus wrote, was comparatively much more advanced than that of medicine. The pharmacy of Celsus forms another curious and interesting part of his work, and, like his surgery, marks a state of considerable improvement in this branch of the art. Many of his formulæ are well arranged and efficacious, and on the whole they may be said to be more correct, and even more scientific, than the multifarious compounds which were afterward introduced into practice, and which were not completely discarded until our own times.*

There is one circumstance respecting Celsus which requires to be noticed, that he is the first native Roman physician whose name has been transmitted to us. Before his time all those who arrived at any degree of eminence were either Greeks or Asiatics, and it would appear that the native practitioners were either slaves or persons from the lower ranks of life, who acted in the subordinate branches

* *Le Clerc*, par. 2. liv. iv. sect. 2, ch. 4, 5. *Barchusen*, diss. 15, p. 231, 2. *Morgagni*, Epistolæ in Celsum. *Haller*, Bib. Med. t. i. §. 49. *Eloy*, in loco. Nouv. Dict. Hist. in loco. *Sprengel*, t. ii. p. 25–8. *Black's* Hist. of Medicine, p. 63-82. *Goulin*, Encyc. Méth. Médecine, in loco. *Petit-Radel*, Biog. Univ. "Celse."

of the profession.* This circumstance may be attributed partly to the low state of science in Rome, even during the period when literature had advanced to a considerable eminence, and still more to the idea of degradation or servility which seems to have been attached to the exercise of any art or profession for the sake of gain. All the trades and manufactures of Rome were therefore carried on by slaves, and medicine seems to have been placed in the same class. It must, however, be observed, that many individuals who were brought to Rome as slaves, either by their natural talents or by some favourable conjuncture of circumstances, overcame the disadvantages of their situation, and made considerable acquirements in different departments of knowledge, and among others in that of medicine. One of the most celebrated of these is Antonius Musa, who was appointed physician to Augustus, and obtained great celebrity from his practical skill: we are told that he was a pupil of Themison, and it appears that he remained attached to the Methodic sect.†

Before we close this part of our history, it will be necessary to take some notice of a class of writers, whose names or works are transmitted to us, who particularly devoted themselves to the improvement of pharmacy. The first of these was Scribonius Largus, who flourished in the reign of Claudius. He appears to have been, like Musa, originally a slave, and it may be conjectured from his work "On the Composition of Medicines," which has been transmitted to us, that he was never able to supply the deficiency of his education. It is a mere collection of nostrums and formulæ, without arrangement or discrimination, and is solely valuable as indicating the state of the art at the time of its publication.‡

Andromachus, a native of Crete, who lived under the reign of Nero, is principally known to posterity as the inventor of certain compounded pharmaceutical preparations, one of which, the theriaca, obtained so much celebrity as to have been retained in our pharmacopœia until the close of the last century. It was composed of no less than sixty-one ingredients, which were combined together with much ceremony and no inconsiderable degree of labour and skill. Its essential ingredient, from which it derived its name, was the dried flesh of vipers, against the bites of which animals it was supposed to be an antidote. But its supposed medical virtues were equal to the number of articles of which it consisted, so that there was scarcely a disease for which the theriaca of Andromachus has not been proposed as a remedy. Andromachus is further remarkable as being the first individual on whom the title of Archiater, or principal physician, was bestowed by the emperors—a title which was continued for several centuries.§

We have next to notice an author of just celebrity, whose writings form one of the most valuable remains of antiquity,—Pliny the naturalist. Although not attached to the medical profession, and even, as appears from many of his remarks, by no means favourably disposed to it, in various parts of his great work he affords us much important information, both direct and indirect, respecting the history of medicine in all its branches, and more especially in all that concerns materia medica and pharmacy.‖ We meet with a great number of curious facts and remarks upon these subjects, so that we are enabled from them to form a tolerably complete conception of the state of medical science in the age in which he wrote We learn from his works that the ordinary practice was, in a considerable degree, what may be termed empirical, consisting in the application of certain remedies for certain diseases, without any inquiry into their mode of operation. The materia medica, which was extensive, consisted principally of vegetable products, and these combined together in various forms, but without any regard to what we should now regard as scientific principles, either chymical or pharmaceutical. We find that they possessed various active remedies, adapted to the greatest part of the

* *Le Clerc*, par. 3. liv. i. ch. 2. The condition of the practitioners of Medicine in Rome was the subject of a learned controversy between Mead and Middleton; see Life of Mead, prefixed to his works, v. i. p. 13, Edin. 1765, and Aikin's Gen. Biog. art. "Middleton."

† *Haller*, Bib. Med. t. i. p. 150, 1. *Eloy*, in loco. *Aikin's* Gen. Biog. in loco.

‡ *Haller*, Bib. Bot. t. p. 76, 7, and Bib. Med. lib. i. §. 51, t. i. p. 166, 7, *Eloy*, in loco. *Sprengel*, t. ii. p. 55.

§ *Le Clerc*, par. 3, liv. ii. ch. 1. *Eloy*, in loco. *Haller*, Bib. Med. lib. i. §. 56, t. i. p. 178, 9.

‖ The late illustrious naturalist Cuvier has formed what I conceive to be a very just and candid estimate of the literary and philosophical character of Pliny, Biog. Univ. t. xxxv. in loco; the same inserted into the translation of Pliny by M. Aj. de Grandsagne, t. i. p. 85. See *Eloy*, in loco, for a list of the various editions, &c. of Pliny; he enumerates one hundred and ten, of which it is worthy of notice that two only were printed in England. *Haller*, Bib. Bot. t. i. p. 91–8.

most important indications, so far as they could be obtained from vegetable or animal substances, but that in the application of them they frequently proceeded upon incorrect principles.

Another writer who lived about the same time with Pliny, and who, although less distinguished for general science, holds a conspicuous rank among the medical authors of this period, is Dioscorides. The same obscurity hangs over every thing which regards the personal history of Dioscorides, as over that of so many individuals to whom we have had occasion to refer. It is generally supposed that he was a native of Asia Minor, and that he was a physician by profession. It appears pretty evident that he lived in the second century of the Christian era, and as he is not mentioned by Pliny, it has been supposed that he was a little posterior to him. The exact age of Dioscorides has, however, been a question of much critical discussion, and we have nothing but conjecture which can lead us to decide upon it. He has left behind him a treatise on the materia medica, a work of great labour and research, and which, for many ages, was received as a standard production. The greater correctness of modern science, and the new discoveries which have been made, cause it now to be regarded rather as a work of curiosity than of absolute utility; but in drawing up a history of the state and progress of medicine, it affords a most valuable document for our information. His treatise consists of a description of all the articles then used in medicine, with an account of their supposed virtues. The descriptions are brief, and not unfrequently so little characterized, as not to enable us to ascertain with any degree of accuracy to what they refer, while to the practical part of his work the same remark nearly applies, that was made above with respect to Pliny, that it is, in a great measure, empirical, although his general principles, as far as they can be detected, appear to be those of the Dogmatic sect. The great importance which was, for so long a period, attached to the works of Dioscorides has rendered them the subject of almost innumerable commentaries and criticisms, and even some of the most learned of our modern naturalists have not thought it an unworthy task to attempt the illustration of his Materia Medica. Upon the whole, we must attribute to him the merit of great industry and patient research, and it seems but just to ascribe a large portion of the errors and inaccuracies into which he has fallen, more to the imperfect state of science when he wrote than to any defect in the character and talents of the writer.*

CHAPTER V.

Account of the opinions and practice of Galen—His history and education—Remarks on his character and writings—His physiology, anatomy, pathology, and practice.

The course of our narrative brings us to one of those extraordinary characters who are destined to form an era in the history of science, both from the actual improvements which they have introduced into it, and from the ascendency which their genius enabled them to acquire over the minds of their contemporaries. Of these, one of the most remarkable that ever appeared, either in ancient or in modern times, is Galen. Galen enjoyed, both from birth and from education, every natural and acquired advantage; his father was a man of rank, and his education appears to have been conducted upon the most liberal and judicious plan. He studied philosophy in the various schools that were then in the highest estimation, and without exclusively attaching himself to any one of them, he is said to have taken from each what he conceived to be the most important parts of their systems, with the exception of the Epicurean, the tenets of which he entirely rejected. His professional studies were conducted upon an equally extensive plan; he attended

* *Le Clerc*, par. iii. liv. ii. ch. 2. *Eloy*, in loco, where we have an account of the various editions, comments, translations, &c. *Sprengel*, t. ii. p. 58–64. *Ackermann*, p. 4. cap. 19. *Haller*, Bib. Bot. t. i. p. 79–87. *Goulin*, Encyc. Méth. Médecine, "Dioscoride." *Du-Petit-Thouars*, Biog. Univ. in loco.

the various schools and travelled through different countries for the express purpose of acquiring information; but it may be presumed that his knowledge of medicine was principally acquired in Alexandria, which still retained its character as the great depository of medical science. After passing a few years at his native city of Pérgamus, spending some time at Rome, and again at Pergamus, he finally returned to Rome, in consequence of the express request of the Emperor Aurelius, and made that city his residence for the remainder of his life.

The works which Galen left behind him are very numerous, amounting in the whole to about two hundred distinct treatises; they are all on subjects directly or indirectly connected with medicine, and exhibit a great extent of knowledge on the subjects of which he treats, and a degree of information, as far as we can judge, greater than that of any of his contemporaries. He appears also to have been a man of a superior mind and of a very decided character; confident in his own powers, and paying but little attention to the opinions of others. Hence he may be accused of arrogance and want of candour, and he can only be defended upon the principle that he was so far in advance of his contemporaries, as to be fully convinced of the futility of their reasoning and the deficiency of their information. The result was, that he gained that superiority over his contemporaries which he assumed, and actually acquired a sway over public opinion, on all points connected with medicine, which has never been obtained by any individual either before or since his time. The rank which Galen held in the medical world has been compared not unaptly to that which Aristotle possessed in the world of general science. For centuries after his death his doctrines and tenets were regarded almost in the light of oracles, which few persons had the courage to oppose; and all the improvements in medicine which were even contemplated, consisted of little more than illustrations of his doctrines or commentaries on his writings. In numberless instances it was deemed a sufficient argument, not merely against an hypothesis, but even against an alleged matter of fact, that it was contrary to the opinion of Galen; and it may be stated without exaggeration, that the authority of Galen alone was estimated at a much higher rate than that of all the medical writers combined, who flourished during a period of more than twelve centuries.

Although such a brilliant reputation might, in some measure, depend upon accidental circumstances, and upon the mere personal character of the individual, we may fairly presume that there must have been a foundation of a more solid nature: and upon an actual survey of the writings of Galen, we shall find ample reason to conclude that he was a man of great talents and of very extensive acquirements. In his general principles he may be considered as belonging to the Dogmatic sect, for his method was to reduce all his knowledge, as acquired by the observation of facts, to general theoretical principles. These principles he indeed professed to deduce from experience and observation, and we have abundant proofs of his diligence in collecting experience, and his accuracy in making observations. But still, in a certain sense at least, he regards individual facts and the detail of experience as of little value, unconnected with the principles which he laid down as the basis of all medical reasoning. In this fundamental point, therefore, the method pursued by Galen appears to have been directly the reverse of that which we now consider the correct method of scientific investigation; and yet, such is the force of natural genius, that, in most instances, he attained the ultimate object in view, although by an indirect path. He was an admirer of Hippocrates, and always speaks of him with the most profound respect, professing to act upon his principles, and to do little more than to expound his doctrines, and support them by new facts and observations. Yet in reality we have few writers whose works, both as to substance and manner, are more different from each other than those of Hippocrates and Galen, the simplicity of the former being strongly contrasted with the abstruseness and refinement of the latter. Those of his works which are the most truly valuable, and in which he actually rendered the greatest service to science are his treatises on physiology. The knowledge which he possessed on this subject was much more considerable than that of any of his contemporaries: in all that regards the operations of the animal economy he was much better acquainted with the facts, and much more ingenious in the application of them. He appears to have been well practised in anatomy, and especially in what may be termed pathological anatomy he far surpassed any of the ancients. His knowledge of particular structures was, in many respects, correct, and in his mode of classifying them he made no inconsiderable approach to the philosophical views which have been taken

of them by the anatomists of the present day. It appears upon the whole probable that he was not in the habit of dissecting the human subject, and, indeed, this may be fairly inferred from his own remarks; but there is reason to suppose that he omitted no opportunity of examining the structure of those animals which the most nearly resemble it, and that from them he has drawn up his descriptions. Considering this radical defect, it must be admitted that they possess great merit, and we may justly express our surprise at the few points in which they betray the imperfection of their origin.*

The pathology of Galen was much more imperfect than his physiology, for in this department he was left to follow the bent of his speculative genius almost without control. He adopts, as the foundation of his theory, the doctrine of the four elements, and like Hippocrates, he supposes that the fluids are the primary seat of disease. But in his application of this doctrine he introduced so many minute subdivisions and so much refined speculation, that he may be almost regarded as the inventor of the theory of the Humoralists, which was so generally adopted in the schools of medicine, and which, for so long a period, entirely engrossed their attention. The four elements, the four humours, and the four qualities, connected in all the variety of combinations, presented a specious appearance of method and arrangement, which took such firm possession of the mind as to preclude all inquiry into the validity of the foundation, and to present us with one of the most remarkable examples of the complete prostration of the understanding in a physical science, where facts were daily obtruding themselves upon our observation, but were either unnoticed or totally disregarded.

The practice of Galen in its general character appears to have been similar to his pathology, and, indeed, to have been strictly deduced from it. His indications were in exact conformity to his theory, and the operation of medicines was reduced to their power of correcting the morbid states of the fluids, as depending upon their four primary qualities or the various modifications of them. Many parts of his writings prove that he was a diligent observer of the phenomena of disease, and he possessed an acuteness of mind which well adapted him for seizing the most prominent features of a case, and tracing out the origin of the morbid affection. But his predilection for theory too frequently warped and biassed his judgment, so that he appears more anxious to reconcile his practice to his hypothesis than to his facts, and bestows much more labour on subtle and refined reasoning, than on the investigation of morbid actions, or the generalization of his actual experience.

The number of treatises which Galen left behind him is very considerable, amounting to nearly two hundred separate works, embracing every department of medical science. His style is generally elegant, but diffuse, and, as may be imagined from the multiplicity of his works, he frequently repeats and copies from himself. Considered under the two classes of anatomy and physiology, and of pathology and practice, the following may, perhaps, be selected as the most valuable, both with respect to the absolute addition which they made to the previous stock of knowledge, and as to the reasoning employed in them. Under the first head we may select the treatise "On the Use of the Parts of the Body," in seventeen books, in which he describes the structure of the different organs, and assigns to each of them its use. This is a work of great anatomical research and physiological ingenuity, which contains many facts that were probably the result of his own investigation, and exhibits a very favourable specimen of his reasoning powers, when not too much under the influence of preconceived hypothesis. The same kind of merit, although less in degree, may be assigned to the treatise "On he Motion of the Muscles," and also to that "On the Formation of the Fœtus," making due allowance for the greater difficulty and obscurity of the subject.

Among the works of the second class the treatise "On Temperaments" has been greatly and justly celebrated, as well as that "On the Seat of Disease," while that "On the Varieties of the Pulse" affords a happy illustration of his peculiar turn of mind, of his acuteness and originality, and, at the same time, of his devoted attachment to hypothesis. The two works, "On the Differences and the Causes of Diseases," and "The Method of Cure," are more especially interesting, as containing the most detailed view of his peculiar doctrines of the humoral pathology, of the indications of cure which he laid down, and the methods which he adopted for their accomplishment. These two latter works exhibit a very complete view of the

* *Douglas*, Bibliog. p. 18–22.

practice of Galen and of that of his contemporaries, and enable us to form a correct opinion of the state of the science when he entered upon the study of it, and of the additions which he made to it. To attempt an analysis of the works themselves, or of the details of Galen's practice, would carry me far beyond the limits of this treatise, and, indeed, it would be principally as a question of literary curiosity that such an examination could be sustained. Their general character may be understood from what has been stated above, and I fully coincide in the remark of a learned and impartial critic, the late Dr. Aikin, who, after giving full credit to Galen for talent and acquirements, thus concludes:—"His own mass and modern improvements have now in great measure consigned his writings to neglect, but his fame can only perish with the science itself." The remark which was formerly made with respect to Hippocrates applies equally to Galen, that the great superiority which he acquired over his contemporaries appeared to repress all attempts at further improvement.*

CHAPTER VI.

An account of the successors of Galen—Decline of medical science—Sextus Empiricus—Oribasius—Aëtius—Alexander Trallianus—Paulus Eginetus—Account of the state of Medicine among the Arabians—Conquests of the Arabians—Their patronage of science—Invention of Chymistry—Ahrun—Serapion—Alkhendi—Rhazes—Ali-Abbas—Avicenna—Mesue—Albucasis—Avenzoar—Averroes—Estimate of the merits of the Arabic school.

In investigating the state of medicine during the middle ages, it is apparent that mankind seemed to be satisfied with the progress which had been made in the science, or were conscious of their inability to surpass the limits which had been assigned to it; and the result was, that for some time after the death of Galen we have few illustrious names to celebrate, and no discoveries to record. Literature in general was now, indeed, rapidly declining, and various causes, both moral and political, were coming into operation, which suspended the progress of science and learning for many centuries, and produced what are justly and emphatically denominated the dark ages. Into these causes it is not our business to inquire; it may be sufficient to remark that they were of so universal a nature as to operate on the human mind generally, and therefore to affect every intellectual pursuit. Medicine, among others, felt their paralyzing influence, although, from certain incidental circumstances to be hereafter noticed, it was not allowed to remain so completely stationary as most of the other branches of science.

About the period when Galen flourished, the Roman empire began to exhibit very decided symptoms of that decline, which, proceeding with more or less rapidity, was never altogether suspended, until it terminated in complete destruction. Even in the most splendid state of Rome, the cultivation of science was very limited, and we have had occasion to remark that almost all the physicians who acquired any considerable degree of celebrity were natives of Greece or Asia, and wrote in the Greek language. This was the case with Galen himself and with the few individuals who succeeded him, whose names are of sufficient importance to be introduced into this sketch. The medical writers of the third and fourth centuries have been characterized by Sprengel as "frigid compilers, or blind empirics, or feeble imitators of the physician of Pergamus."†

The only exception to this remark is Sextus Empiricus, who appears to have been a contemporary of Galen, and probably derived his appellation from the sect

* *Conring*, Introd. cap. 3. §. 16; cap. 4. §. 17, et alibi. *Le Clerc*, par. iii. liv. iii. ch. 1–8, contains a very ample account of all that regards the writings and opinions of Galen. At this period we lose the further aid of this candid and judicious historian of medicine. *Barchusen*, diss. no. 16. Nouv. Dict. Hist. "Galien." *Haller*, Bib. Med. lib. i. §. 80, 1. *Lauth*, liv. v. par. 1. *Sprengel*, sect. 3. ch. 6. *Ackermann*, cap. 21, 2. *Blumenbach*, Introd. sect. 75. *Goulin*, Encyc. Méth. Médecine, "Galien." *Renaudin*, Biog. Univ. "Galien."

† T. ii. p. 170.

to which he attached himself, as there are some treatises of his still extant, in which he attacks the principles of the Dogmatists with considerable acuteness. We may conclude from his works that he was a man of learning and talents, well versed in the principles of the philosophers, and familiar with all the branches of literature and science which were cultivated in his time.* He is, however, the last medical writer to whom the character of Sprengel does not strictly apply. Oribasius, who lived in the fourth century, Aëtius in the fifth, Alexander Trallianus in the sixth, and his contemporary Paulus of Ægina, were all zealous Galenists, who professed to do little more than to illustrate or comment on the works of their great master. Their writings are principally compilations from their predecessors; they are, however, occasionally curious from the incidental facts which they contain, and by furnishing us with extracts or abstracts of treatises which are no longer extant; but this constitutes almost their sole value. The only additions to the practice of medicine which they afford are an account of certain surgical operations, which is given us by Aëtius, and a treatise by Paulus on midwifery, which is more complete than any that had previously appeared, and was long held in high estimation. But even these, which form but a small portion of the whole of their works, are connected with so much credulity and superstition, as to indicate at least the most degraded state of the science, if not the defective judgment of the writer. Aëtius expressly recommended the use of magical arts and incantations, and that, not, as has sometimes been done in a more enlightened age, from a knowledge of the effect they might produce on the imagination of the patient, but apparently from his own opinion of their physical operation on the system.† It must, however, be admitted that both in Alexander Trallianus and in Paulus we meet with various descriptions of disease, which indicate that they possessed the talent of accurate observation; and we may conclude that, although in what respects opinions they were the devoted followers of Galen, yet in the simple detail of facts their authority may be relied upon with considerable confidence.‡

With the death of Paulus, which took place about the middle of the seventh century, we may date the termination of the Greek school of medicine, for after his time we have no work written in this language which is possessed of any degree of merit. Those which occasionally appeared were mere servile transcripts of Galen and his disciples, or compilations formed without judgment or discernment, devoid of original observation, or even of any attempt at generalization or arrangement. In this degraded state was the science of medicine reduced in the former seats of learning, when a new school arose in a different quarter of the world, which will require our attention, from the actual additions which it made to our knowledge, as well as from the mode of its origin and the nature of its connection with the Grecian and Roman schools.

The city of Alexandria still retained its reputation as the great school of medicine, partly resting its fame on the excellence of its former professors, and in some measure depending on the value of its extensive library and other institutions favourable to the cultivation of science, the forms of which at least were still preserved. But even these feeble remains were destroyed by the conquest of the Arabians in the seventh century, who, in the genuine spirit of blind bigotry, appeared to be actuated by the barbarous desire of totally eradicating science from the face of the earth. The catastrophe which befell the Alexandrian library is too well known to be repeated in this place,§ a calamity, the full extent of which can scarcely be appreciated by one who is in the habit of regarding literature only as it exists in modern times, when books of all descriptions are multiplied to an excessive degree, and when the loss occasioned by the most splendid collection would be nearly confined to a single nation or community. It appears, however, that notwithstanding the brutal violence of the Saracen invaders, some books escaped from the general wreck of literature and science, and that there were not wanting some individuals who were capable of estimating their value. Among these relics were the writings of Galen, and we are informed that at an early

* *Enfield*, v. ii. p. 136.

† *Conring*, cap. 3. sect. 18-20. *Sprengel*, sect. 6. ch. 1-3.

‡ *Freind*, Hist. Med. p. 398 et seq. and p. 420 et seq. *Eloy*, "Paul d'Egine." *Haller*, Bib. Med. t. i. p. 311-15.

§ I have adopted the generally received account of this transaction: but the learned reader need not be informed, that a considerable, and perhaps not an unreasonable degree of doubt attaches to it. *Gibbon*, c. 51. v. 9. p. 392-5.

period of the Saracenic empire they began to be held in very high estimation; they were translated into the Arabic language, were commented upon and elucidated in various ways, and soon acquired a degree of celebrity scarcely short of what they had previously enjoyed among the Greeks themselves. The Arabians were also in possession of the works of Hippocrates, but the simplicity of this author was less adapted to their taste than were the metaphysical refinements and elaborate arrangements of Galen, so that, while the latter was regarded with a respect amounting almost to veneration, the former was little read or estimated.

After the immediate successors of Mahomet had completed their conquest of a considerable part of the civilized world, they rested from their warlike triumphs, and seemed disposed to add to the splendour of their empire by the cultivation of the arts of peace. The patronage of literature was an express object of many of their rulers, and even the works of the Greek philosophers were translated and studied with much assiduity.* But the spirit of Mohammedanism was decidedly averse to intellectual improvement, and we accordingly find that no additions were made to general science, and that very little was accomplished even in the collection of facts and observations. To this remark, however, medicine forms an exception; for although the Arabian physicians adopted implicitly all the theories and speculations of Galen, and seldom ventured in the smallest degree to deviate from his practice, we are indebted to them for the description of some diseases which either made their first appearance about this time, or had not been before specifically noticed.†

I must mention in this place a remarkable occurrence in the history of science, and one which indirectly produced a very important effect upon the subject of this dissertation,—the invention of chymistry. The origin of chymistry, like that of all other sciences, is obscure and uncertain. Traces of what may be called chymical operations are to be found even among the Jews and Egyptians, but it is generally admitted that they are to be regarded as incidental occurrences, depending upon accidental observations, pursued no further than the object immediately in view, and not considered, even by those who practised them, as more than mere insulated facts, leading to no general principles nor to any further investigations. The practice of chymistry as a distinct pursuit seems to have originated with the Arabians, and by them was made subservient to the purposes of medicine.‡ It is not my business to inquire into the mode in which this art took its first rise, or to trace its subsequent progress, except so far as may be connected with my present subject; and this will be the most conveniently accomplished by giving in succession a brief account of the most distinguished writers who belonged to the Arabian school of medicine.

The earliest Arabian writer on medicine, of whom we have any certain account, would appear to be Ahrun, who was a priest at Alexandria. He published a treatise entitled "Pandects;" it has not come down to us, but it deserves to be noticed, as it is said to have contained the first description of the small-pox. He was contemporary with Paulus, and from the account of his works which has been transmitted to us by Rhazes, we may conclude that the science of medicine was cultivated at that time with at least as much success among the Arabians as among the Greeks. During the next three centuries, although we meet with the names of many individuals who acquired a certain degree of temporary celebrity, we have none who rendered themselves so far pre-eminent as to entitle them to particular notice in this brief sketch. The first author of whom it will be necessary to give any distinct account is Serapion: he lived in the ninth century, and is said to have been a native of Damascus. His treatise, entitled, according to the fancy of the translators, "Aggregator," "Breviarium," or "Therapeutica Methodus," was written originally in Syriac; its professed object was to give a complete system of the Greek medicine, and to incorporate with it the principles and practice of the Arabians. Like those of the rest of his countrymen, the greatest part of Serapion's work is taken from those of his predecessors, and particularly from Galen; but it contains some few novelties with respect both to doctrine and to practice, and in one point,

* The Arabians are said to have commenced the study of literature and science in the 106th year of the Hegirah, under the Caliph Almamoun; *Ockley's* Hist. of the Saracens, pref. p. xi.

† For an account of the Arabian school of medicine generally, the reader is referred to *Freind*, who treats upon every thing connected with it in the most ample manner. See also *Barchusen*, diss. 17. §. 12 et seq. *Sprengel*, sect. 6. ch. 5. *Cabanis*, §. 6.

‡ *Freind*, Hist. Med. pars 2. sub init. *Sprengel*, t. ii. p. 246-266.

the preparation and composition of medicines, as well as in the articles employed, we may notice a decided improvement.*

At the same time with Serapion lived Alkhendi, a multifarious writer, who obtained a very high degree of celebrity among his contemporaries, perhaps more from the variety of his acquirements than from the excellence he attained in any particular department. He is said to have assiduously cultivated mathematics, and the various branches of natural philosophy, as well as medicine; and among other subjects to which he particularly directed his attention, we find astrology expressly enumerated. In relation to his varied attainments, he was styled the subtle philosopher, the learned physician, and the Greek astrologer. As an example, both of the spirit of the age and of the genius of the individual, we may remark that Alkhendi applied the rules of geometrical proportion and of musical harmony to regulate the doses of medicines, and to explain the mode of their operation—a mistaken application of science, which, however gross it may now appear, we must reflect was not entirely exploded until long after the revival of letters.†

We now come to one of the most illustrious of the Arabian school, Rhazes. He was born at Irak in Persia in the ninth century; he is described as a person of various acquirements, as being well versed in general science, and, as his writings demonstrate, of unwearied industry. There is some reason to doubt whether the principal work which has been transmitted to us under his name, entitled "Continens," is precisely in the form in which it was left by its author: but there appears to be sufficient proof of its general authenticity to enable us to deduce from it, as well as from his other acknowledged works, an ample and correct view of the opinions and practice both of Rhazes himself and of his contemporaries. For the most part, the writings of Rhazes are deficient in method and arrangement, and they consist principally of abstracts and comments on Galen and the Greek physicians; but they also contain observations that appear to be original, and we even meet with the description of some diseases which were either new, or, at least, were not noticed by the ancients. Rhazes gives us a correct and elaborate description of the small-pox and measles, detailing the theory which was formed of their nature and origin by the Arabians, and the treatment which they employed. The most curious and original work of Rhazes is his "Aphorisms," in one part of which he professedly gives the result of his own observation and experience. But even this treatise, which was long regarded as of the highest authority in the schools of medicine, contains little that is really new and valuable; and when we compare it with its celebrated prototype, we cannot but be impressed with the very small advance which had been made in the science and practice of medicine during a space of nearly thirteen centuries. The most important additions which Rhazes made were, perhaps, rather in surgery and in pharmacy than in medicine, strictly so called; and it is worthy of notice that, in the latter department, we have some of the earliest indications of the free employment of what were styled chymical remedies.‡

A short time after Rhazes lived Ali-Abbas, a writer of considerable celebrity, who obtained the appellation of the magician. His principal work, entitled "Opus Regium," professes to contain a complete view of the state of medicine in all its branches; it consists chiefly of abstracts of the doctrines and opinions of the Greek physicians, but along with these are contained some original observations. At the time of its publication it was very highly estimated, and perhaps may be considered as possessing more real value than most of the works that proceeded from the Arabian school.§

The fame of Ali-Abbas was, however, almost entirely eclipsed by that of Avicenna,‖ who flourished about a century later, and who rose to the highest pitch of celebrity, so as to be regarded by his countrymen as superior to Rhazes, or even

* *Haller*, Bib. Bot. t. i. p. 183–9. For an account of the earlier writers of the Arabian school, see *Freind*, pars 2. sub init.

† See particularly a paper by Balguy, on the mode of ascertaining the doses of vomiting and purging medicines, in Edin. Med. Ess. v. iv. p. 33, published in 1737, under the superintendence of some of the first men of science in the university.

‡ *Freind*, p. 483–91. *Haller*, Bib. Med. Prac., lib. ii. §. 135. *Eloy*, in loco. *Lauth*, p. 280–2. *Sprengel*, t. ii. p. 285–301.

§ *Freind*, p. 481. *Haller*, Bib. Med. lib. ii. §. 137. t. i. p. 380. *Sprengel*, t. ii. p. 301–5.

‖ The actual name of this individual is said to have been Al-Hussain-Abou-Ali-Ben-Abdallah-Ebn-Sina. *Sprengel*, t. ii. p. 305. In most cases it appears that the names by which the Arabians are generally known in Europe were not their real names.

to Galen himself. Avicenna was born at Bochara, in the year 980, and was carefully educated in all the learning of the times, consisting principally of the Aristotelian logic and dialectics, with the imperfect mathematical and physical science, that was then taught in the schools of Bagdat. He appears to have been possessed of an ardent desire for acquiring knowledge, and of great industry, but united to a portion of fanaticism, indicative of a defective judgment, and fostered by the spirit of the age, which induced him to conceive himself under the influence of supernatural revelation. After a foundation of general science, he entered upon the study of medicine, which he prosecuted with the same diligence, and with the same spirit of enthusiasm. His reputation became so high, that he was early introduced to the court, and for some years was without a rival in his profession. His death, which took place in the fifty-sixth year, was probably hastened by some political intrigues, in which he unfortunately became entangled.

The works which Avicenna left behind him are numerous, and embrace both general science and medicine. The former long maintained a high character for extent of information and profundity of learning, and, according to the standard of the age, were probably entitled to this commendation. But his fame, both with his contemporaries and with posterity, principally rests upon his great medical work entitled "Canon Medicinæ," which may be regarded as a kind of encyclopedia of all that was then known of medicine, and of the sciences connected with it, anatomy, surgery, therapeutics, and botany. Its celebrity was so great as to have acquired for its author the title of prince of physicians; for some centuries it was the received text-book in most of the medical schools, both of the Arabians and the Europeans; until the revival of letters it superseded, in a great measure, the works even of Galen; it produced scarcely less numerous commentaries and epitomes, and had not entirely lost its authority two centuries ago. Yet the matured judgment of one of the most learned and candid of the modern critics has not hesitated to bestow upon this so-much-vaunted production the character of an ill-digested and servile compilation, containing little that is new, either in the way of observation or of practice. Indeed, the sole aim of Avicenna seems to have been to collect matter from all quarters, without paying any regard to its value, or to the mode in which it was arranged. He was a devoted admirer of Aristotle and Galen, and seemed to imagine that the ultimate object, either of the philosopher or the physician, consisted in being intimately acquainted with their writings, and in defending them against all objections. Upon the whole, after making every allowance for the period in which he lived, it seems difficult to account for the very great credit which he acquired, not only during his lifetime, but which was attached to his writings after his death; a credit so much greater than what they merit, either from the importance of the information which they contain, or the mode in which it is conveyed.*

There are two Arabian writers of the name of Mesue, whose celebrity entitles them to a brief notice in this place, although considerable uncertainty attaches both to their individual history and to their works. The elder of them is said to have lived in the eighth, and the younger in the tenth century; and they are both represented as being Christians of the Nestorian sect, but to have exercised their profession at Bagdat. The elder Mesue is principally remarkable as having been among the first who made correct translations of the Greek physicians, and especially of Hippocrates and Galen, into Arabic; for although he appears to have composed many original works, we do not find that they rose into any high repute even among his contemporaries. To the younger Mesue is usually ascribed a treatise on materia medica and pharmacy, which for a long time was in great estimation, and was republished and commented upon even as late as the sixteenth century; it probably contained a full view of the state of the science when he wrote, and is interesting, as it indicates the introduction of several new remedies into medicine; but in other respects it is to be regarded merely as a literary curiosity.†

The last of the Arabians who acquired any considerable distinction as a writer on medical subjects is Albucasis. So little is known of his personal history, that

* *Freind*, lib. ii. p. 491–2. *Haller*, Bib. Med. lib. ii. §. 139. *Eloy*, in loco. *Lauth*, p 282–5. *Enfield*, v. ii. p. 222, 3. *Sprengel*, t. ii. p. 305–22. *Hutton's* Math. Dict., in loco. *Goulin*, Enc. Méth. Médecine, "*Avicenne.*" "*Avicenne,*" in Biog. Univ.

† *Freind*, p. 481, 2. *Haller*, Bibl. Med. Prac. lib. ii. §. 126. *Eloy*, in loco. *Enfield*, v. ii. p. 231. *Sprengel*, t. ii. p. 325.

both his birth and the country in which he lived have been the subject of controversy, and appear to be entirely conjectural. His principal works are on surgery; and the reputation which he acquired in this department is almost as great as that of Avicenna in medicine. He seems to have been a man of learning and talents, to have made himself master of the writings and practices of his predecessors, and to have improved upon them. The description which he has left of his operations shows him to have possessed a degree of boldness and dexterity which could only exist in one who was well acquainted with his art, and had been habituated to the practice of it. His practice was what we should now consider as unnecessarily severe, making much more use of the knife and of the actual cautery than is done in modern times, and in all respects inflicting both more pain and more permanent injury on his patients. The works of Albucasis appear, however, to have afforded by far the most complete view of the practice of surgery which then existed; and from this circumstance, as well as from their real merit, they were for many ages considered as standard performances, and employed as the text-book in various schools and colleges.*

It remains for us to give an account of two individuals, who, although natives of Spain, and residing principally in that country, were of Saracenic origin, and wrote in the Arabic language—Avenzoar and Averroes. Avenzoar was born at Seville, in the end of the eleventh century, and is said to have lived to the unusual length of one hundred and thirty-five years; but probably some error may have crept into this statement, in consequence of both his father and his son having been, like himself, engaged in the practice of medicine. His principal work, entitled "Thaissyr,"† which consists of a general compendium of medical practice, displays more originality and discrimination than the writings of any of the native Arabians; so that, although he was professedly a disciple of Galen, he does not hesitate, on certain occasions, to shake off his authority when his opinions or practice were not sanctioned by his own experience. We may collect, from certain parts of his works, that he practised both surgery and pharmacy, as well as medicine, properly so called; and we have many valuable observations on each of these departments. Upon the whole, we may consider Avenzoar as respectable both from his general character and his professional skill, and entitled to our regard as one of the improvers of his art.‡

Besides the reputation which Avenzoar derived from his own merits, he was perhaps still more known among his countrymen as being the preceptor of the celebrated Averroes. Averroes was a native of Corduba, and flourished in the twelfth century; he was of illustrious birth, and highly educated in all the branches both of literature and of science which were then taught in the Saracenic colleges of Spain. From certain political causes he was, in the early part of his life, the subject of religious persecution; but he succeeded in repelling the attacks that were made upon his faith, and was finally reinstated in all his former honours and in the public estimation. These circumstances, coinciding probably with the peculiar temperament of his mind, gave to his character a degree of ascetic gloom and austerity; but he appears to have been a man of distinguished worth and of superior abilities. Averroes's professional occupations were principally in a civil capacity; he is therefore to be regarded, not as a practitioner, but as a scholar, who pursued the study of medicine as a branch of physical science. But such was his ardour in the pursuit of general knowledge, and the fondness which he manifested for this particular department, that he made himself intimately acquainted with it in all its details; and in his great work entitled "The Universal," he shows that he was not deficient in any part of the science which could be acquired by the mere study of books. As a philosopher, he was a zealous and obsequious follower of the opinions of Aristotle, and as a physician, of those of Galen; he published many comments on both of them, which acquired the highest degree of reputation, and for many ages were considered as standard performances. Yet there is reason to suppose that he was ignorant of the Greek language, and, like his contemporaries, became acquainted with Aristotle and Galen only through the medium of Arabic translations. The great estimation in which the works of Averroes were held is

* *Freind*, p. 506–524. *Haller*, lib. ii. §. 148. *Eloy*, in loco. *Lauth*, p. 285, 6. *Sprengel*, t. ii. p. 327-32.

† Freind designates the Thaissyr as "liber qui omnia victus et medicinæ præcepta in plerisque morbis contineret:" p. 493.

‡ *Freind*, p. 492–503. *Haller*, lib. ii. §. 141. *Eloy*, in loco. *Sprengel*, t. ii. p. 332–7.

proved by the number of editions of them which were published from time to time one of which appeared at Venice so late as the commencement of the seventeenth century. With respect to his medical writings, as they do not profess to be the result of original observation, we cannot be surprised that their reputation is no longer supported. They are, indeed, entirely neglected; and it may be affirmed that, notwithstanding the celebrity which they once enjoyed, and which they so long maintained, they have not left a single permanent addition to the science.*

With Averroes terminated the Arabic or Saracenic school of medicine; after his time we have no writer whose name is sufficiently distinguished to deserve particular mention: even the study of the ancients began to be neglected, while no original observations were made, and no novel opinions or speculations were framed which might tend to exercise the mind or dissipate the darkness which now covered all parts of the world.

If we inquire into the causes of the great celebrity of the Arabian school of medicine, we shall be led to the conclusion that they were rather incidental and factitious, than derived from its absolute merits. It has been justly observed, that a considerable portion of this celebrity must be ascribed to the comparative condition of the neighbouring countries. From the eighth to the twelfth century was, perhaps, the period in which Europe was in the state of the most complete barbarism and superstition. The only remains of a taste for literature and science, or for the fine arts, were found among the Moors and Arabs; and it was from this source, by the intervention of the crusaders, and the intercourse which was thus effected between the Asiatics and the Europeans, that the philosophical and medical writings of the Greeks were first made known to the inhabitants of Italy and of France. And even after their introduction into Europe, it appears that they were for some time read only in Arabic translations, or in Latin versions made from these translations; so that it was not until a considerably later period that they were perused in their native language. Indeed, so completely was the study of the Greek tongue suspended during the dark ages, that it may be doubted whether the writings of the ancient physicians might not have been entirely lost to posterity, had they not been preserved in these translations.

There are, however, two points in which the Arabians conferred a real obligation upon their successors,—the introduction of various new articles into the materia medica, and the original description of certain diseases. The additions which the Arabians made to pharmacy consisted partly in the vegetable products of the eastern or southern countries of Asia, which were only imperfectly known to the Greeks, and with which they had no intercourse. Among other substances we may enumerate rhubarb, tamarinds, cassia, manna, senna, camphor, various gums and resins, and a number of aromatics, which were brought from Persia, India, or the Oriental Isles. But a still more important addition which they made to the pharmacopœia consisted in what were styled chymical remedies, such as were produced by some chymical process, in opposition to those substances that were used nearly in their natural state. With respect to the origin of pharmaceutical chymistry, it may be sufficient to observe, that a rude species of chymical manipulation appears to have been practised in Arabia in the fifth century, that distillation was performed, and that the metals were subjected to various processes, by which some of their oxides and salts were produced. The immediate object of these processes was the transmutation of the metals; an operation which, for many centuries, formed a main subject of attention to almost all the individuals who were considered as cultivators of natural philosophy.

With respect to the second subject alluded to above, the description of new diseases, it is well known that, from causes which are now altogether inexplicable, diseases of the most marked and distinct nature, which are the least liable to be mistaken or confounded with other affections, and which, had they existed, are too violent to have been overlooked, are not mentioned by the Greek and Roman physicians, and are described for the first time by the Arabians. Of these the two most remarkable are the small-pox and the measles. There is some reason to suppose that the small-pox had been known in China, and the more remote parts of India, at a much earlier period; but it is generally admitted that it was first recognised in the western part of Asia, at the siege of Mecca, about the middle of

* *Freind.* p. 503-6. *Bayle's* Dict., in loco. *Moreri's* Dict., in loco. *Haller*, lib. ii. § 142. *Eloy*, in loco. Nouveau Dict. Hist., in loco. *Enfield*, t. ii. p. 226-231. *Sprengel*, t. ii. p. 337-41.

the sixth century, when it raged with great violence in the army of the besiegers. We have remarked above, that the disease was alluded to by Ahrun shortly after its appearance, but it was Rhazes to whom we are indebted for the first clear and distinct account of its symptoms and treatment. There is no subject in the whole range of medical science of more difficult solution than that which respects the origin of diseases, especially such as, when produced, are propagated solely by contagion. The full discussion of this subject would, however, carry me far beyond the limits of this treatise; it is only alluded to in this place as an historical fact, in connection with the writings of the Arabians.*

We are indebted to them for the transmission of the works of the ancient Greek physicians, to which they made certain additions of insulated facts with respect to the description of diseases; but, with respect to the general principles of therapeutics, the additions, if any, are few and imperfect. In anatomy they made no advances, and we have reason to suppose that the examination of bodies, either in a sound or a morbid state, was scarcely practised by them. Medical theory was much attended to, but their theories consisted more in subtle refinements, formed upon the Aristotelian model, than in the study of pathology, or an accurate discrimination of the phenomena of disease. Some little advance appears to have been made in surgery by Albucasis, but he is the only individual who seems to have aimed at improving this branch of the profession; and it may be doubted whether the practice of surgery was not, upon the whole, in a retrograde state during the period of which we are now treating. It is in the department of pharmacy alone that they made any additions of real value; and although in this case it may be attributed more to accidental circumstances than to any enlightened spirit of improvement, yet it is incumbent upon us to acknowledge the obligation which was both extensive and permanent.†

CHAPTER VII.

State of Medicine in Europe after the Extinction of the Arabian School—Medical Schools of Monte-Cassino and Salerno—Medicina Salernitana—Constantinus Africanus—Actuarius—Rise of the Study of Anatomy—Mondini—Gilbert—Effect of the Crusades, of the Reformation, and of the Invention of Printing, on the Literature of Europe—On Medical Science—Alchymists—Establishment of Universities—Linacre—Chymical Physicians—Paracelsus—Appearance of New Diseases.

During the flourishing period of the Saracenic school of medicine, which may be considered as extending from the eighth to the twelfth century, the science remained nearly stationary, or was even retrograde among the successors of the Greeks and Romans. We have scarcely a single name of sufficient importance to arrest our attention, and we have no improvements to record, either in theory or in practice. The only attempts that were made in Greece or in Italy during this period, which deserve to be noticed, are connected with the Neapolitan schools of Monte-Cassino and of Salerno, which acquired some degree of reputation in the eleventh century. It was at this period that the physicians attached to the school of Salerno wrote the verses on dietetic medicine, entitled "Medicina Salernitana," a work which, as afterward published with the commentary of Arnoldus de Villa-

* On the origin of the small-pox, see *Freind*, p. 524–9; *Mead's* Discourse on Small-pox and Measles, ch. i.; *Thompson's* Inquiry into the Origin of Small-pox; *Plouquet*, Literatura Digesta, "Variola, Antiquitas, Historia," in loco: ample references may be found in this learned and laborious compilation on all analogous topics, but we may regret that the writer appears to have aimed rather at multiplying his authorities than estimating their value.

† We are indebted to *Freind* for a candid and judicious account of the Arabian medical school, p. 529–33. *Haller's* second book of his Bibl. Med. Prac. is devoted to the same subject. See also *Robertson's* Charles V. vol. i. note 28. *Berington's* Middle Ages, App. No. 2. *Gibbon's* History, vol. x. ch. lii. *Ackermann*, cap. xxvii-xxix. *Oelsner*, Des Effets de la Religion de Mahommed, p. 196–9: this author is perhaps too much disposed to exalt the merits of the Arabian school. *Kühn*. Bib. Med. sec. 3, of what he styles "Fontes Medicinæ," is entitled "Scriptores Medici inter Arabes præcipui," p. 180–6. *Portal*, Hist. Anat. ch. ix. "Des Anatomistes et des Chirurgiens Arabes," t. i. p. 143 et seq. *Blumenbach*, Introd. sect. 6. "Arabes."

nova, acquired considerable celebrity, and may be regarded as a valuable document, by its affording, in a small compass, a correct idea of the state of Italian medicine at that early period.*

In connection with this subject we may notice Constantinus Africanus, who is supposed to have flourished about the end of the eleventh century. He was, as his name imports, an African; he possessed an ardent desire to obtain knowledge, studied in the schools of Bagdat, and is said to have travelled even into India. At his return to his native country he was regarded as a sorcerer, and was compelled, in order to save his life, to take refuge in Italy, where he was finally attached to the university of Monte-Cassino. He principally employed himself in translating the works of the Greek and Latin physicians into Arabic, which was at that time the general language of science. His translations are, however, said to be incorrect, and his style barbarous; while his works, which are not professed translations, appear to be composed of transcripts from other authors, without any particular merit, either of selection or of arrangement.†

We must mention in this place a writer whose real name has not been transmitted to us, commonly called Actuarius, from the office which he bore in the court of Constantinople.‡ He is supposed to have lived in the twelfth century. The works which he left are numerous, and, although consisting principally of extracts from Galen and the Arabian physicians, with whose writings he appears to have been familiar, are not without some additions derived from his own observations and experience. He is considered as having been the first Greek physician by whom chymical medicines are mentioned, as well as various articles of the materia medica, which were originally introduced by the Arabians. We may regard Actuarius as a diligent collector of facts, acquainted with all the information of his age, and as more free from prejudice and bigotry than the generality of his contemporaries.§

After the extinction of the Saracenic school of Spain, we have an interval of about three hundred years, from the twelfth to the fifteenth century, during which what are termed the dark ages still remain enveloped in the deepest gloom; every department of science was neglected, and among others that of medicine fell into its lowest state of degradation. What remained, either of literature or of science, was in possession of the monks, who were themselves grossly ignorant, and whose interest it was to preserve mankind in the same state of ignorance. The exercise of the medical profession was principally in their hands, and they still adhered, for the most part, to the doctrines and practice of Galen, but with these they mixed up a large portion of superstition, and had not unfrequently recourse to magic and astrology. By these means they obtained an unbounded influence over the minds of the people, and operated so powerfully on the imagination of their patients as, in many cases, to give an apparent sanction to their confident assumption of supernatural agency.‖ The only branch of science which was cultivated with any ardour or success was chymistry. The chymistry of these times can indeed only be interesting to us, as having led indirectly to the discovery of various substances, which have been found of great importance in medicine, to which we have already referred. Its immediate objects were twofold, the transmutation of the baser metals into gold, and the discovery of what was termed a universal medicine, which should possess the property of removing all diseases, and preserve the constitution in a state of health and vigour; objects which, it is unnecessary to observe, were completely vain and illusory. Yet by promoting a spirit of research, and by making the experimentalist acquainted with the various forms and properties of the substances on which he operated, they gave him some insight into the physical laws of matter, and by a gradual, although very slow process, laid the foundation of the splendid improvements of modern science. Many of the alchymists of the dark ages, we can have no doubt, were impostors of the lowest description, who were completely aware of the folly of their pretensions; but at the same time there were others who appear to have been the dupes of their own credulity, and who bestowed a large portion of their time and fortune upon these researches. Between

* Haller ascribes the Latin verses of the Medicina Salernitana to John of Milan; he remarks, that of this work there had been published "editiones ferè innumerabiles;" Bib. Med. lib. iii. sec. 140. See also Eloy, t. ii. p. 599. Ackermann, sec. 422. and Blumenbach, sec. 114.

† Freind, p. 533, 4. Haller, Bibl. Med. lib. iii. sec. 159. Eloy, in loco. Sprengel, t. ii. p. 355, 6.

‡ For the origin of the term, see Adelung, Gloss. Man., in loco.

§ Freind, p 452-462. Eloy, in loco. Sprengel, t. ii. p. 241-4.

‖ Sprengel, sec. vii. ch. i.

these two extremes there were some rare cases of individuals, who may be entitled to hold an intermediate rank, who were sincere and honourable in their views, and, without giving full credit to the professions of the alchymists, conceived that the objects at which they aimed were at least not altogether impossible. To these we may add another class of individuals, consisting of that singular and unaccountable compound of knavery and folly, which is not confined to the subject now under consideration, where it is extremely difficult to draw the line between these two qualities, or to decide which of them forms the predominant characteristic.

The school of Salerno, to which we have referred above, obtained a degree of celebrity from its local situation, this city being one of the great outlets from which the crusaders passed over from Europe to Asia in their expeditions to Palestine; and it was probably from this circumstance that Robert of Normandy stopped at Salerno, in order to be cured of a wound which he had received in the holy wars. It was on this occasion that the verses mentioned above, and which were addressed to him, were written. Upon the decline of the Saracenic universities of Spain, the only medical knowledge which remained was in Italy, where a few individuals, who were not of the ecclesiastical profession, continued to comment on Galen and Avicenna, and occasionally to deliver lectures; but we have a long dreary interval, in which there is nothing to arrest our attention, or to relieve the dull monotony of ignorance and superstition.

During this period the school of Salerno still retained its reputation, and was even favoured with especial privileges by the emperors; but its merits were probably rather comparative than absolute, for we do not find any improvements that emanated from it, nor any authors whose writings maintained their celebrity after the age in which they were produced. It is, however, in one respect deserving of our notice, as it appears to have been the earliest establishment in which what may be styled regular medical diplomas were granted to candidates, after they had passed through a prescribed course of study, and been subjected to certain examinations. The regulations are upon the whole judicious, and display a more enlightened and liberal spirit than might have been expected in that age, when the human mind was in so degraded a state.* The school of Salerno maintained its celebrity until the thirteenth century, when it was eclipsed by the general diffusion of medical science through Europe, and more particularly by the rising reputation of the universities of Bologna and Paris.

It was about this period that we may date the commencement of a practice which has eventually proved of the greatest importance to medical science in all its departments—the study of human anatomy. We have already had occasion to remark that the ancients, even in their most enlightened ages, seldom if ever ventured to examine the human subject, but were content to derive their knowledge of it from the dissection of animals which were supposed the most nearly to resemble it, making up the deficiencies by the casual examinations which were afforded them by accidents or diseases, and perhaps more frequently by supposed analogies, or rather by the efforts of the imagination. The individual to whom the credit is ascribed of having so far overcome vulgar prejudice as to have introduced this most important improvement into his art, is Mondini, a professor in the university of Bologna, who is said to have publicly dissected two female subjects about the year 1315, and who published an anatomical description of the human body, which appears to have had the rare merit of being drawn immediately from nature. This work deservedly obtained a high reputation: for three hundred years it was considered as a standard performance, and was used as a text-book in the most celebrated of the Italian universities. Mondini is also entitled to the gratitude of posterity for having given a very early, if not the first example of anatomical plates; the figures were cut in wood, and although, as might be supposed, they were not executed with much elegance or delicacy, they are said to have been correct and expressive.†

About the same time with Mondini lived Gilbert, surnamed Anglicanus, a writer who must be considered as peculiarly interesting to us, from his being the earliest English physician whose name is sufficiently celebrated to entitle him to a place in the history of medicine. There has been much controversy respecting the

* Freind, p. 535-7. Eloy, art. "Salerne." Lauth, p. 291, 2. Ackermann, cap. xxxi.

† Freind, p. 546. Haller, Bibl. Anat. §. 120, t. i. p. 146, 7. Eloy, in loco. Portal, Hist. Anat. t. i. 209-16 Sprengel, t. ii. p. 432-4. Douglas, Bibliogr. Anat. p. 36-9. Blumenbach, §. 118.

date of his birth; but it appears the most probable that he flourished in the beginning of the fourteenth century. At this time medical science, as well as all other kinds of knowledge in this country, was in a state of the lowest degradation. There were no public means of instruction in any of the branches of natural philosophy. The light of science, which had dawned in the south of Europe, had not yet extended to the remote shores of Britain, and the learning of the age, which was confined to the monks, consisted entirely of scholastic disquisitions and the disputations of polemical theology. We are not, therefore, to expect in the writings of Gilbert much of genuine philosophy or of real science; his principal work, which is entitled "Medicinæ Compendium," consists chiefly of subtile distinctions, disquisitions respecting trifling and insignificant topics, with minute divisions of his subject, which lead to no useful purpose or general conclusion. His medical theories are principally taken from Galen, while his mode of reasoning proceeds upon the technical principles of the Aristotelian dialectics; he adopts the former without discrimination, and employs the latter without judgment. He frequently refers to the Arabian physicians, and there is some reason to suppose that it was through their means, *i. e.* through the medium of the Latin translations of their writings, that he made himself acquainted with the opinions of Galen.*

But although we are compelled to pass this general censure upon the works of Gilbert, justice demands it of us to admit, that his defects may be fairly ascribed to the age and country in which he lived, and that he deserves great commendation for the attempt which he made, however imperfect it may have been. Nor are his works entirely without merit or originality; he has described some diseases in such a manner as to show that, under more favourable circumstances, he might have excelled in the art of making observations; he occasionally gives us some particulars of his practice, which prove that he was capable of exercising a correct judgment in the treatment of the cases which were submitted to him, and we are indebted to him for some additions to the materia medica, and for some improvements in pharmacy.†

About this period a grand political revolution was commencing in Europe, which eventually produced an entire change in the civil condition of its inhabitants, and indirectly affected, in an equal degree, its science and its literature. The feudal system, after being firmly established for some centuries, began to be shaken, perhaps in the first instance, by the crusades. These expeditions, although undertaken from a spirit of gross superstition and bigotry, yet, by giving a degree of excitement to the mind, and still more by making the crusaders in some degree acquainted with the literature of the Arabians, laid the foundation for subsequent improvements. There has been much controversy, not only respecting the absolute merit of the Arabian literature, but respecting the influence which it had on that of Europe. On the first of these points, as far at least as regards the medical sciences, I have already offered a few remarks; and on the latter I may observe, that at the period of the crusades, whatever may be our estimate of the absolute merit of the Saracenic schools of learning, they were undoubtedly superior to those of the Christians, if indeed these latter can be entitled to the appellation. The armies of the crusaders were certainly not the best adapted either for appreciating the learning of the countries which they invaded, or for transferring any portion of it to their own; but still an intercourse of two or three centuries could not fail of having produced some effect, and in fact we know, not only that Arabian books were read and studied in Italy and France, but that it was almost exclusively by the medium of these books that the knowledge of the Greek and Roman authors was kept alive.‡

The advantages which were derived to the Europeans from their intercourse with Asia were, however, of but little moment compared to the great events to which I alluded above. The first of these was the capture of Constantinople, in the middle of the fifteenth century, by Mahomet the Second. The Greek monasteries of this city had been for some time the refuge of the learned men who had been driven from Italy by the perpetual wars in which that country had been so long engaged.

* Warton's Hist. of Eng. Poet. v. i. p. 443.

† Freind, p. 547–50. Eloy, in loco. Aikin's Biog. Mem. of Med. in Gt. Brit. p. 8, 9. Sprengel, t. ii. p. 4026.

‡ Gibbon, ch. lxi. Sprengel, sect. 7, ch. iii. I must remark that the opinion expressed in the text, respecting the influence of the crusades on the literature and science of Europe, differs in some degree from that of Mr. Mills, as stated in his interesting work on the Crusades, v. ii. p. 354–68

They had taken with them what they considered as their most precious treasures, the manuscripts of the ancient classical writers, probably regarding them more as objects of curiosity than of real importance. These manuscripts had now been buried for a long time in their libraries, their existence being unknown to the rest of the world, when the monks were expelled from their retreats by the Turkish conquerors, and, flying into Italy, carried back with them their classical manuscripts. A spirit of improvement had already begun to manifest itself in this country, which was considerably incited by their guests, who, in their turn, by their change of situation and by the new society into which they were introduced, became more aware of the value of their literary treasures; while their own acquirements, limited as they were, gave them a degree of respect with their new associates which tended to inspire them with a desire of further improvement.*

The other event to which I referred, and which occurred about thirty years after the destruction of the Byzantine empire, was one of infinitely more importance, both in its immediate and its ultimate effects. Considered in all its bearings, both moral and political, it may probably be regarded as the most important which has ever occurred in the history of civilized society. My readers will not need to be informed that the great event to which I refer is the Reformation. Into the causes of this event, the motives of Luther and his associates, the difficulties with which they had to struggle, and the means by which they succeeded in overcoming these difficulties, it is not our business to inquire. It only remains for me to notice its effects on science, and more particularly on medical science. I have remarked above that a certain degree of mental exertion had begun to manifest itself in the fourteenth century, that this was in some measure brought into action by the excitement produced in consequence of the crusades, and that the minds of men were thus prepared to receive the great truths which were so powerfully impressed upon them by the reformers. The first effect, however, of the Reformation was rather unfavourable to the progress of science and literature. The attention was entirely absorbed by the violence of theological controversy, and the civil feuds which succeeded put a stop to the peaceful labours of the scholar and the philosopher. But if a temporary pause was thus produced, the subsequent advance was proportionally rapid. No sooner were the minds of men delivered from the thraldom of theological bigotry, than they felt a strong impulse to free themselves from the tyranny of opinions on all other subjects in philosophy; and although it still required the lapse of some centuries to shake off the undue authority of Aristotle and Galen, and to form a fair estimate of their real merits, they were at least regarded as fair topics for discussion, while innovators were every day rising up, who ventured to question their infallibility, without the danger of being stigmatized as schismatics and heretics.†

The happy invention of the art of printing, "an art which derides the havoc of time and barbarism," and which fortunately occurred about the same period, most powerfully tended to co-operate with the labours of the reformers, both in religion and in science, by affording them the means of more readily communicating the result of their inquiries, and of preserving the records of knowledge from the danger which they had lately experienced of being totally lost or destroyed.‡ One of the first uses which was made of this important invention was, not only the multiplication of the works of the ancient classics, which had been brought by the Byzantine monks into Europe, but, by making mankind sensible of their value, other works of a similar kind were eagerly sought after, and thus, in the course of a few years, manuscripts were discovered of almost all the classical writings of which we are now in possession.§ The munificence, and even the voluptuous extravagance of Leo X. and the other Italian potentates, by the direct encouragement which they gave to literature and the fine arts, powerfully coincided with the current of public opinion. For, although by inciting the daring spirit of Luther to take those steps of open hostility against the papal authority, which he probably little contemplated in the first instance, they produced effects very different from those originally intended, yet they must be considered

* Ackermann, ch. xxxii. Cabanis, § 7. † Enfield, v. ii. book 8, ch. ii.

‡ For remarks on the scarcity and value of books, see Robertson's Charles V., v. i. ch. v. note 10; Warton's Hist. of English Poetry, passim; Berington's Middle Ages, book vi. p. 507, 8.

§ Gibbon, v. x. ch. lxvi. Warton, passim. Berington, book vi. p. 478 et seq. Shepherd's Life of Poggio, passim. Hallam's Middle Ages, v. iii. p. 577 et seq.

as among the indirect causes which conspired to produce the great mental revolution of the fifteenth century.

The science of medicine in its various departments was not slow in partaking of the beneficial effects of the change which we have been describing. The writings of the Greek physicians, which had for some centuries been studied through the medium of Arabic translations, or even of Arabic commentaries, were now read in their original language, or in correct Latin versions.* It was found that Avicenna, Averroes, and the great luminaries of the Saracenic schools, had in many cases either misunderstood or perverted the doctrines and tenets of Galen. and his genuine writings now began to be substituted for the imperfect transcripts of them which had so long occupied their place. The works of Hippocrates were also printed in their original form; but it required a considerably longer period of mental education to enable the bulk of medical readers to appreciate his merits, so that, although various editions of his works were printed, and learned treatises written to explain them, Galen still retained the pre-eminence in public estimation.

A practice began to prevail about the fifteenth century, which very materially contributed to advance the science of medicine, and especially the practical part of it—the publication of monographs of particular diseases and of individual cases, with the reports of hospitals or other public institutions. This plan was not, indeed, altogether new, for we meet with narratives of cases even in Hippocrates; but it had been either misunderstood, or had been so much perverted from its original design and legitimate object, as to have been rendered of little value. Many of these early collections, it must be acknowledged, were formed without judgment, and consisted rather of marvellous stories than of histories from which any practical inference could be deduced; but they served the purpose of inducing a habit of observation, and of directing the attention more to facts than to mere hypotheses. In each succeeding age we find this plan to have been more generally adopted, and at the same time to have been much improved in its method: so that we may undoubtedly consider it as one of the means by which medical knowledge has advanced so rapidly in modern times.

Before I close the second period of the history of medicine, it will be necessary to make a few observations on the progress of chymistry, and on the influence which it had on medical science. I have already made some remarks on the rise of this science, and on the progress which it made among the Arabians, and have stated that it originated in the futile and sordid desire of converting the baser metals into gold. In its primary object it of course totally failed; yet in the numerous and laboured efforts which the alchymists made to accomplish their object, it is admitted that they acquired considerable information about the nature and properties of the bodies on which they operated, and thus produced various compounds, principally of a metallic nature, which were eminently useful in the arts of life, and especially in pharmacy. We further owe to the Arabian chymists the discovery of the process of distillation, and the art of preparing extracts; they introduced the use of sugar into pharmacy instead of honey, in the composition of syrups and conserves; they seem to have made some approach to the formation of the mineral acids, and to have procured several of the earthy and neutral salts.

The art of alchymy was early transferred into the different countries of Europe, and was pursued with as much ardour as by the Arabians, and perhaps with even more superstition and credulity. Some of the alchymists acquired, during their lifetime, a high degree of popularity, and, notwithstanding the unphilosophical nature of their occupation, are not altogether unworthy of notice in the history of science. Albertus Magnus, bishop of Ratisbon, Raymond Lully, a Spanish ecclesiastic, and Arnoldus of Villanova, a professor in the university of Barcelona, all flourished in the thirteenth century, and left behind them writings which, although they are encumbered with a mass of folly and mysticism, exhibit in a certain degree the spirit of philosophical research, together with an ample share of industry and patient investigation.† In the same age lived Roger Bacon: he

* There is reason to believe that Greek was little read in any part of Europe until after the capture of Constantinople in 1453; Ockley, pref. p. xii.

† Freind, p. 543-5. Bayle's Dict., art. "Albert." Eloy, "Arnauld de Villeneuf." Moreri, art. "Albert," t. i. p. 269; and "Arnaud de Villeneuf," t. i. p. 346, 7. Ackermann, §. 446, 7. Berington, book v. p. 370. Sprengel, t. ii. p. 437-443. Blumenbach, §. 120-3. Turner's Modern History of England, book ii. ch. i. p. 7, 8.

may be classed among the alchymists, inasmuch as he adopted some of their principles and practices; but in the turn of his mind, and in the spirit with which he entered upon his experimental researches, he exhibited a genius which far outstripped the age in which he lived.* The philosopher's stone, which was the object of so much painful research, besides its property of producing gold, was supposed also to possess the power of curing all diseases, and hence obtained the title of the universal medicine. This vain and fantastical notion was indirectly the cause of some pharmaceutical discoveries; for to this we may consider ourselves indebted for the mercurial preparations, and for the experiments of Basil Valentine on antimony, which led to their introduction into medicine about the end of the fourteenth century.

Among the distinguishing features of the period at which we are now arrived, I must not omit to mention the various universities which were established in many of the great cities in the southern parts of Europe, of which the medical chairs, in most cases, formed a very distinguished part. I have already had occasion to mention the university of Salerno, which was the first of these establishments after the destruction of the Roman empire. The next in order of time appears to have been that of Montpellier, which is said to have been established not long after that of Salerno, and which acquired a high degree of reputation, which it maintained for many centuries. We are informed that Bologna had acquired considerable celebrity as a school of medicine in the thirteenth century; that about half a century later medical lectures were delivered in the universities of Vienna and Paris; and that about the same time medical schools were established in Padua, Pavia, Milan, Rome, and Naples, and most of the other cities of Italy, which each of them acquired a certain degree of reputation, necessarily varying with the abilities and characters of their professors, but all contributing to advance medical science, both by the actual acquisition of knowledge, and by the influence which they exercised in removing the undue veneration that was still paid to the writers of antiquity.† In the north of Europe the progress of literature and science was much more tardy. The natural sciences were scarcely regarded as an object of attention, and medicine was still strictly confined to the study of the works of Galen, or even to those of his Arabic translators. The only exception of which our country can boast is Linacre, a native of Canterbury, who, after studying at Oxford, travelled into Italy, and spent some time at the court of Florence, where he acquired a portion of that love of literature which so eminently distinguished the family of the Medici. On his return to England he was appointed physician to the royal household, and employed his influence in establishing medical professorships in the universities of Oxford and Cambridge, and in forming the foundation of the London College of Physicians.‡

From the various causes which have been mentioned, and probably from some others of less moment, a spirit of general improvement now began to manifest itself; the arts and sciences gradually revived; philosophy, in all its branches, was studied on a more correct plan and with a more enlightened object, and medicine was not slow in partaking of the beneficial influence. One of the first symptoms of this improvement was an increasing relish for the writings of Hippocrates, and the revival of his method of studying and practising medicine. The taste for complicated theory and refined speculation gradually declined, and in the same proportion the value of correct observation and an accurate detail of facts began to be duly estimated.

A circumstance which tended in a considerable degree to shake the authority of

* Freind, p. 537-543. Campbell, Biog. Brit., in loco. Bale, Scrip. Illust. Brit. p. 342-4. Cave, Hist. Lit. t. ii. p. 324-6. Bayle, in loco. Eloy, in loco. Berington, book v. p. 373. Hallam's Middle Ages, vol. iii. p. 539, note. Nouv. Dict. Hist., in loco. Sprengel, t. ii. p. 397, 8. Wood's History of Oxford, by Gutch, vol. i. p. 332-344. Enfield, Hist. Phil. vol. ii. p. 346-8; and in Aikin's Gen. Biog., in loco. Suard, Biog. Univ., in loco.

† The dates of the establishment of the various universities may be found in Eloy, t. iii. p. 223. The learned work of Tiraboschi, "Storia della Literatura Italiana," contains the most ample information respecting the universities of that country. See also Lauth, Hist. d'Anatomie, liv. v. part 4, sect. l. §. 2.

‡ Freind, p. 587-591. We here lose the assistance of this learned and judicious historian. Eloy, in loco. Cabanis, p. 144, 5. Sprengel, t. ii. p. 8. Aikin's Biog. Mem. of Med. p. 28-47. In connection with Linacre we may mention the name of Key, Kaye, or, as it was latinized, according to the custom of the times, Caius, whose liberality to the University of Cambridge deserves honourable mention. Aikin, Biog. Mem. p. 103-136; and Gen. Biog., in loco. Eloy, in loco.

Galen, and to diminish the veneration in which his opinions had been held for so many ages, was the rise of the sect of the Chymical Physicians. After chymistry had been used with advantage for the purpose of improving the processes of pharmacy, it was applied to the explanation of the phenomena of vitality, and of the operation of morbid causes upon the living system. The theories of these chymical physicians we now regard as altogether false and inapplicable; but they were advanced with so much confidence that they obtained many adherents, and for some time the opinions of the medical world were divided between the rival doctrines of the Galenists and the Chymists.

Among the most noted supporters of the chymical theory was Paracelsus, an individual whose claim to our notice depends more upon his consummate vanity and presumption than upon his abilities and acquirements. His professed object was to undermine the authority of the Galenists; and for this purpose he did not hesitate to hold forth the most absurd claims, and to practise the basest arts of quackery. He boasted that he had discovered the elixir vitæ, the universal remedy, of which mankind had been so long in search; and he publicly burned the writings of Galen and Avicenna, because, in consequence of his discovery, they were of no further use. It is somewhat difficult to determine in what degree Paracelsus was actually the dupe of his own folly; but whatever may have been his real opinion of the efficacy of his elixir, his own death, at the early age of forty-eight, served to humble the confidence of his followers, and to reduce his reputation to its real standard.

But although the personal character of Paracelsus received an irreparable shock by this event, his doctrines continued to attract a number of zealous advocates. With respect to the nature of these doctrines, it will be necessary to say but a few words in this place. The leading principle of the Chymists was, that the living body is subject to the same chymical laws with inanimate matter, and that all the phenomena of vitality may be explained by the operation of these laws. The proofs which they adduced in favour of this principle, and the illustrations which they gave of the nature of these laws, were completely futile and unsatisfactory; and it may be asserted that the strength of their reasoning was much more apparent in the mode by which they attempted to controvert the hypothesis of the Galenists, than in the direct arguments which they brought forward in favour of their own doctrine. In truth, the chymical elements of Paracelsus were at least as hypothetical as the physiological elements of Galen, and were even less applicable to the explanation of the vital actions of organized beings. The only obligation which we owe to the chymical physicians is the introduction into medicine of certain substances, chiefly metallic preparations, which, in the hands of the more enlightened practitioners of modern times, have proved very valuable additions to the materia medica.*

After the death of Paracelsus, his peculiar theories fell into disrepute and were little attended to; but the sect of the chymical physicians continued to flourish even as late as the seventeenth century, when we meet with many examples of men of learning and sagacity who attempted to explain the phenomena of the animal economy by the laws of chymistry. To the visionary speculations of the Chymists there was united a large portion of superstition and mysticism; and so much did this feeling coincide with the spirit of the times, that even the men who were most illustrious for their learning and science were either actually infected with these notions, or did not venture so far to oppose the prevailing opinions of their contemporaries as to avow their disbelief of them. Astrology and magic were generally practised by the members of the medical profession, while various rites and ceremonies were observed, which implied the belief of supernatural agency, but which, by a singular inconsistency, was supposed to be a constant and necessary part of the process.

Before we conclude this portion of our subject, we must notice the remarkable circumstance, that about this period, during the fourteenth and fifteenth centuries, some very formidable diseases made their appearance in Europe, the origin of which is still very obscure, after all the discussion and investigation that has

* Le Clerc, p. 792 et seq. Barchusen, Diss. 19. Conring, cap. xi. §. 16, 17. Haller, Bib. Med. t. ii. p. 2 et seq. Eloy, in loco. Sprengel, sect. ix. ch. 2. Cabanis, sect. ix. Hutchinson's Biog. Med. vol. ii. p. 197–209. Enfield, vol. ii. p. 451–4. Aikin's Gen. Biog., in loco. Blumenbach, Introd. §. 169. Renauldin. Biog. Univ. "Paracelse."

taken place respecting them. Among these, one of the most remarkable is what was termed the *Sudor Anglicanus*, which is first mentioned about the end of the fifteenth century, and which, for about fifty years, raged at intervals with extreme violence in England and in some other countries in the west of Europe.* In the fifteenth century we have the first correct description of the hooping-cough; and from the manner in which it is spoken of by the contemporary writers, it would appear that it was considered by them as a new disease. The sea-scurvy, if not entirely unknown to the ancients, was at least not distinctly recognised until this period, so that, if it existed previously, we may conclude that it was less violent in its effects: a circumstance which has been ascribed, with great plausibility, to the spirit of naval enterprise which sprang up at this period, and which led to the undertaking of long voyages.†

The great number of establishments which were formed during the dark ages for the cure of leprosy, was at one time supposed to be a proof that it was a new disease in Europe, imported, as was imagined, from Asia by the crusaders. There has been much nosological discussion concerning the exact nature of the disease to which this term ought to be applied; whether there were actually two species of leprosy, one of which was indigenous in the East, and another species in Europe. Some writers have conceived that a combination of the two was produced at this period, while others, again, have supposed that the disease had previously existed in Europe, but that, in consequence of the greater degree of communication between the different parts of it, which was brought about by the crusades, the disease was either more extensively propagated, or at least was brought more into notice, and that more active means were therefore employed for its relief.‡

It was about the same period, when the western part of the old continent was in its lowest state of degradation, that we hear of the ravages of those varieties of fever emphatically styled the plague, which were described in the thirteenth, fourteenth, and fifteenth centuries as invading various parts of Europe and Asia, and sweeping away a large proportion of the inhabitants.§ The accounts which we have of these epidemics would indicate that they were not an absolutely new disease, but that the symptoms were modified and aggravated by the peculiar condition of the great bulk of the people; a conclusion which is confirmed by the fact, that, as the physical and moral condition of nations has been ameliorated, the occurrence of these diseases has become proportionally rare, so that we conceive them to be almost incompatible with the improvements in civilization and in medical police which exist in the greatest part of Europe.

But whatever may be our opinion concerning the origin of the leprosy and the plague, there is another disease where, from the peculiarity of its symptoms, its decidedly contagious nature, the ordinary method of its propagation, and the universality of its occurrence, we are enabled to fix the date of its appearance in Europe with more certainty. It is now generally agreed that it was near the close of the fifteenth century that the symptoms of syphilis were first recognised in Italy, from which country the disease very rapidly extended over the whole of Europe. Concerning its primary origin much controversy has taken place; many writers have attempted to prove that it was brought into Europe from America by Columbus; but this opinion, which was at one time pretty generally received, is now abandoned, nor are we able to offer any plausible conjecture respecting its introduction from any other quarter.

The same difficulty, indeed, exists in this case as in that of all those diseases which are produced by no cause except by a specific contagion. Almost every individual is obnoxious to them upon the application of this cause, and this liability appears to be little affected by constitution, age, habits of life, climate, and other external circumstances. The question is, how were they first produced? It is impossible to imagine that the first created individual was born with all these diseases upon him, yet we know of no distinct cause now in operation which could, in the first instance, have generated them. These remarks apply to the small-pox and the measles, which, as was stated above, were first known to the Europeans about

* Sennert, De Feb. lib. iv. cap. 15. Freind, p. 567, 8. Plouquet, "Febris Sudatoria," t. ii. p. 162 Cullen's Synopsis, t. ii. p. 77, 8. Sprengel, t. ii. p. 491–4.

† Freind, p. 583. Sprengel, t. ii. p. 494–6.

‡ Sprengel, t. ii. p. 371–5.

§ Plouquet, "Febris Mailgna," and "Pestis," in loco. Cullen, t. ii. p. 74–7, 139–41.

the middle of the sixth century, and it applies perhaps still more remarkably to the case of syphilis. This point must be regarded as one of those mysteries of which at present we are unable to offer any solution. It is true that the manners of the age in which this disease is recorded to have first made its appearance were grossly licentious, and in many respects unfavourable to health; but still we see no satisfactory reason why the specific poison of this disease should have been generated; yet it appears impossible to conceive that, if it had previously existed, it could have remained for any length of time unknown or undescribed.*

I have now brought down the sketch of the history of medicine to the period when the light of improvement was bursting forth from various quarters, when men were engaged in the investigation of the different departments of science upon a plan which, although not free from error, was more correct than that of their predecessors, and which, by a slow but steady process, led to the establishment of those principles which eventually produced the complete triumph of truth and philosophy over error and superstition.

CHAPTER VIII.

General View of the State of Medicine during the Sixteenth Century—Revival of the Hippocratean School—Account of the Galenists—the Chymists—The Anatomists—Vesalius, Fallopius, Eustachius.

I HAVE already given an account of the manner in which the taste for the classical writers of antiquity was gradually developed during the fifteenth century, and I stated that in medicine, as well as in the other departments of science, the Greek writers began to be studied in the original, instead of their being read through the medium of translations and commentaries. As this taste was further matured, the works of Hippocrates continued to rise into estimation in preference to those of Galen, and a new school of medicine was formed, which obtained the name of Hippocratean, the professed object of which was to proceed upon the inductive principle, of first ascertaining facts, and by their generalization to form the theory. That in every instance they adhered to this plan we cannot affirm: indeed we have too many instances where they forgot or misapplied their own principles, but still the importance of accurate observation was generally admitted, and although mankind could not at once abandon their former errors, they became aware of their existence, and of the method by which they might be corrected.

The contest between the Galenists and the Chymists, which agitated the whole medical world during the fifteenth century, was indeed still maintained through the sixteenth; but it was conducted upon more rational principles, and by men of more enlarged and more enlightened views. The Galenists were for the most part more scientific and learned than their adversaries; they consisted of the professors in the universities, and what may be styled the regular practitioners: and although they were still strongly attached to the tenets of their master, they did not omit to collect facts and to watch the phenomena of disease. Their practice may be characterized as being at the same time complicated and inert; their materia medica was principally taken from the vegetable kingdom, while their prescriptions were long and multifarious, consisting of a prodigious number of articles, combined together in such a manner as to render it almost impossible to conceive the probable operation of the compound, their indications, at the same time, being derived from an incorrect hypothesis, and being often either unintelligible or impracticable.

The Chymists were the bold empirics of the day, without learning or experience; but they endeavoured to supply the deficiency by confidence and temerity, and by

* Freind, p. 568-583. Astruc, De Morbis Veneriis. Hunter, on the Ven. Dis. p. 9, 10. Sprengel, t. ii. p. 499, et seq. Plouquet, "Syphilis, Historia," &c., in loco. Black's Hist. of Medicine, p. 147-155.

these formidable weapons they frequently triumphed over their adversaries. They discarded the long prescriptions of the Galenists, rejected many of the articles of their pharmacopœia, while they introduced the active metallic preparations, and made free use of the most powerful remedies of all kinds. The rival sects mutually upbraided each other with the injurious effect of their respective plans of treatment, and probably there was but too much foundation for their accusations; for if on the one hand the Chymists, by their rashness committed many fatal blunders, the Galenists, by their feeble remedies, must have frequently failed in subduing disease or arresting its progress.

It appears that, upon the whole, the Chymists, like the analogous characters in the present day, acquired a greater share of popularity than their opponents. Their arrogant pretensions, the more decisive and intelligible nature of their indications, coupled with the artifices which they practised for the mere purpose of acquiring popularity, gave them a decided advantage over their more learned and more dignified rivals, who were both unable and unwilling to contend with them in the race of empiricism. By degrees, however, the chymical physicians rendered themselves more worthy of the public estimation, by making themselves better acquainted with the principles and practice of their art; the search after the philosopher's stone was gradually abandoned; and although many of the doctrines which they still professed were altogether unfounded, they were less palpably absurd than those of their predecessors.

Another circumstance occurred about the period of which we are now treating, which contributed to produce a most important reform in the science of medicine —I refer to the study of human anatomy. With a very few exceptions, which have been noticed above, during a space of more than a thousand years, since the death of Galen, very little advance had been made in our acquaintance with the structure of the body. The professors of the Arabian school, with their successors in Italy and France, for the most part contented themselves with copying the descriptions of the ancients, without ever calling in question their accuracy, or endeavouring to confirm or refute them by their own observations. Even after the examination of the human subject had been practised for some time, and its necessity generally acknowledged, it was long before mankind could so far free themselves from the tyranny of authority as to admit that any imperfection could exist in the works of Galen, or that his descriptions were not to be preferred even to the evidence of the senses.

In reviewing the state of medical science during the sixteenth century, it will assist us in our progress if we arrange the principal authors under the three classes of the Physicians strictly so called, the Chymists, and the Anatomists. Under the first head we purpose to include both the writers who still adhered implicitly to the tenets of Galen, and those who, paying less regard to mere authority, devoted themselves more to observing the phenomena of disease, and the effects of remedies, and who may be considered as having laid the foundation of the modern Hippocratean school. Of these, some of the most distinguished by their character or writings were Cornarus and Mercurialis in Italy, Hollerius, Fernel, and Duret in France, Lommius and Forest in Holland, Sennert, Plater, and Foës in Germany, and Linacre in England.*

The limits to which I am necessarily confined will not permit me to enter into any detail of the individual merits of these authors, or into any analysis of their writings or opinions. For the most part, they were possessed of a competent knowledge of ancient literature, and well acquainted with the works of the Greek physicians; many of them were professors in universities or teachers of medicine, and engaged in extensive practice. They were generally diligent collectors of facts, and many of them voluminous writers, either publishing their own observations, or commenting on the ancients. Their practice was, in a great measure, taken from Galen, with the additions that had been derived from the materia medica of the Arabians, and in a few instances from the Chymists; but these latter were regarded as dangerous and empirical, and it was not until they had been long sanctioned by popular use that they were received into the authorized pharmacopœias. The actual advance which the practice of medicine received from these authors was not very considerable; but by their learning and diligence, and their general respectability, they contributed to raise the character of the profession,

* Sprengel, t. ii. passim. Cabanis, ch. ii. §. 10.

and to prepare the mind to receive the improvements in science which were gradually unfolded in the next century, and to apply them to the department of medicine.

With respect to the Chymists of this period, although they composed a numerous and active body, yet there is none of them whose name is sufficiently distinguished above his fellows to require being particularized in this place. As science and knowledge gradually advanced, the absurdity of their speculations was more generally perceived, and their pursuits were either abandoned, or were directed by a more philosophical spirit; and although the search after the universal medicine was not entirely discarded, they began to occupy themselves with inquiring into the chymical constitution of the body, and investigating the changes that were induced in it by disease. This investigation was, indeed, attended with little success; their experiments were crude and imperfect, and their modes of analysis altogether inefficient. But still some important observations were made, and new processes were invented, and the foundation began to be laid for the more enlightened views of their successors in the succeeding century.

But the benefit conferred upon the science of medicine by the labours of the Chymists was trifling and uncertain compared to the great and direct advance which was produced by the researches of the Anatomists. Some attention had been paid to the structure of the body by the earlier Italians, and they had even ventured, in a few instances, to dissect the human subject; yet scarcely any discovery or any improvement deserving of notice had been made for many ages, when Vesalius, about the middle of the sixteenth century, entered upon his career of inquiry. He was the first anatomist who threw off the yoke of authority, which had been imposed by a blind veneration for the opinion of the ancients, and who ventured to conceive the possibility of error in the writings of Galen. Vesalius prosecuted his researches with unwearied diligence; and, disregarding the obloquy which was heaped upon him, he succeeded in publishing an anatomical work, which at this day we behold with admiration, and which maintains its character as a faithful transcript of nature.*

But the reputation of Galen was too firmly established to be affected in any considerable degree by the observations of any single individual, however highly he might be entitled to the respect of his contemporaries. Long and acrimonious discussions occurred between the defenders and the opposers of Galen, some maintaining that his descriptions of the parts of the body were absolutely perfect, while others undertook to prove, by direct and palpable facts, that Galen's knowledge of the human form was not complete. It was asserted, on the one hand, that he had seldom examined the human subject, and that his descriptions were frequently taken from apes and monkeys; an imputation which was firmly denied by his zealous advocates. Eustachius, Fallopius, and others of great and deserved reputation for their anatomical skill, undertook the defence of Galen; and it was not until after a long and severe struggle that the truth was established, and that it was agreed that the anatomy of the ancients was in many parts imperfect, and that the errors which had been pointed out by Vesalius actually existed.† It would be foreign to my purpose to enter into a minute examination of the labours of the individual anatomists, or to mention in detail the successive improvements which were effected in their department. With respect to the practice of medicine, which is my more immediate object, it does not appear that they effected any direct improvement; but they contributed indirectly to its advancement, in no small degree, by completely establishing the important point, that the opinions of the ancients were not to be considered as infallible, but were to be subjected to the ordeal of free inquiry.

* Eloy, "Vésale." Haller, Bib. Anat. lib. 4. §. 163. t. i. p. 180 et seq. Sprengel, t. iv. p. 5-9; Douglas, Bibliogr. Anat. p. 64-73. Renauldin, Biog. Univ. "Vésale."

† Haller, Bib. Chir. lib. 5. "Schola Italica;" and Bib. Anat. lib. 5. "Schola Italica." Fallopius, §. 200. t. i. p. 218 et seq. Eustachius, §. 205. t. i. p. 233 et seq. Douglas, Bibliogr. Anat. in Fallopio, p. 94-6, et in Eustachio, p. 98-100.

CHAPTER IX.

State of Medicine during the Seventeenth Century—The Chymical and Mathematical Sects—Progress of Anatomy—Fanatics—Chymical Physicians—Sylvius—Willis—Sydenham—Mathematical Physicians.

ALL the changes of opinion which we have described as occurring in the sixteenth century, continued to advance with an accelerated progress during the seventeenth The preference which was given to Hippocrates over Galen was daily gaining ground, and, as the consequence of this, the habit of correct observation was confirmed, and the value of the observations was more justly appreciated.

In the mean time anatomy was making rapid strides. Being a science which depended more immediately upon the accumulation of matters of fact, which required for their attainment little more than industry and mere observation, errors were more readily discarded than on those subjects in which much reasoning was necessary, and in which it was rather an inference from facts than the facts themselves which constituted the object of the investigation. The investigations of the anatomists extended to every part and structure of the body; the forms and texture of the bones, the muscles, the nerves, the vessels, and the various viscera were each in their turn made the subject of particular and minute examination by some of the eminent men of the age. These labours were amply rewarded by the splendid discovery of the circulation by the immortal Harvey, and of the absorbent system by Asselli, Rudbeck, and Bartholine; while the structure and office of the lungs, and the relation which it bears to the heart, were explained by Malpighi, Hooke, Mayow, and their associates.*

With respect to the chymists of this period, their opinions were gradually disengaged from the tissue of mystery and credulity in which they had been so long involved, when about the middle of the century the science was finally placed upon its correct philosophical basis by the genius of Boyle. He correctly regarded it as an investigation into the change of properties which bodies experience by their action upon each other, and he pursued the investigation, not by presupposing the existence of certain occult causes and hypothetical agencies, but by an accurate examination of the effects which bodies actually produce upon each other, when placed within the sphere of their mutual action.†

It is, however, not a little remarkable that while the science of chymistry generally, and more especially the sect of the chymical physicians, was purifying itself of its grosser errors, we meet with not unfrequent instances where it continued to be combined with a singular degree of fanaticism. There was indeed no period, since the time of Paracelsus, when there were more remarkable examples of the prevalence of this spirit, and in no country were they more notorious than in England. The writings of Fludd, who practised in London in the early part of the seventeenth century, afford a curious compound of learning and folly, of profound erudition, united to an implicit faith in astrology and in all the cabalistic opinions of the Jewish doctors.‡ Perhaps a still more remarkable example of this combination is that of the celebrated Kenelm Digby, a man of rank and of refined education, who, during his travels on the continent, became initiated into this mysterious chymical philosophy, and on his return gave a specimen of his opinions by publishing an account of the virtues of the sympathetic powder.§

* The fourth volume of Sprengel is principally occupied with a luminous view of the anatomical discoveries of this period.

† Campbell, Biog. Brit. in loco. Haller, Bib. Med. lib. ix. §. 702, t. iii. p. 109-13. Nicholson, Aikin's Gen. Biog. in loco. Morell, Brewster's Encyc. in loco. Suard et Cuvier, Biog. Universelle, in loco.

‡ Enfield, v. ii. p. 454, 5. Sprengel, t. v. p. 6-9. Eloy, in loco; Haller, Bib. Med. t. ii. p. 469. Aikin's Biog. Mem. of Med. p. 271-5. Hutchinson's Biog. Med. v. i. p. 303-5.

§ Sprengel, t. v. p. 9; Eloy, in loco; Campbell, Biog. Brit. in loco. Aikin's Gen. Biog. in loco

Another of these individuals who obtained great celebrity was Valentine Greatrix, who cured all diseases by the imposition of the hand, and who even ventured to oppose his power in this respect to the royal touch of Charles.* These circumstances are interesting, not merely as forming a part of the history of medicine, but as displaying a singular feature in the history of the human mind; demonstrating the difficulty which exists in eradicating from it errors and follies, even the most gross and palpable, when they have once become deeply rooted.†

While what may be more strictly termed chymistry was advancing into the state of a science, a combination was formed between its principles and those of physiology, which gave rise to the new sect of the chymical physicians. Their leading doctrine was, that the operations of the living body are all guided by chymical actions, of which one of the most important and the most universal is fermentation. The states of health and of disease were supposed to be ultimately referrible to certain fermentations, which took place in the blood or other fluids, while these fluids themselves were the result of specific fermentations, by which they were elaborated from the elements of which the body is composed. Again, certain humours were supposed to be naturally acid, and others naturally alkaline, and according as one or the other of these predominated, so certain specific diseases were the result, which were to be removed by the exhibition of remedies of an opposite nature to that of the disease in question. According to the theory of the chymical physicians, fever was supposed to originate in an acid condition of the humours, and was consequently to be cured by alkalies: and in conformity with what is so often found to take place in tracing the history of medicine, they discovered that alkalies were actually the most efficacious remedies for fever.

The individual who may be considered as having first given a connected and consistent view of the theory of the medical chymists is Sylvius. He was born at Hanau in Flanders in 1614; he graduated in the university of Basil, practised for some time at Amsterdam, and finally was appointed to fill the chair of practical medicine at Leyden, where by his genius and eloquence he acquired a high degree of popularity. From this circumstance his peculiar opinions obtained a very extensive circulation, and the hypothesis of fermentation, with the acid and alkaline states of the fluids, after some time became the fashionable doctrine of the French and the German physicians, and had many zealous defenders in our own country.‡

One of the most respectable of the advocates of the chymical doctrines of medicine was our learned countryman Willis. He was only a few years younger than Sylvius, and was early in life attached to the science of chymistry, which he afterward applied with much ingenuity to the explanation of the functions of the animal economy. In the year 1659 he published his celebrated treatise on fermentation and on fever, the object of which is to prove that every organ of the body has its peculiar and appropriate fermentation, and that a morbid state of these ferments is the cause of all diseases. The hypothesis is in itself totally false, but it is supported by considerable ingenuity, and his works are of real value, as containing an accurate account of the phenomena of disease. Willis was also the author of some treatises of very considerable merit on the nervous system, and on various physiological topics, by which his reputation is amply supported as one of the most eminent medical philosophers of the age.§

The reputation of Willis has, however, been somewhat obscured by the still higher reputation of Sydenham, a man scarcely inferior to any that has passed under our review. He has been frequently styled the English Hippocrates, and there are various points of analogy between them, both as to general character, and as to their peculiar mode of viewing the operations of the animal frame. The writings of Sydenham, like those of his great predecessor, abound in theory, but they also resemble those of Hippocrates, in containing the most accurate detail

Nouv. Dict. Hist. in loco. Aikin's (Miss) Mem. of Charles I. v. i. p. 410-16. See "A late Discourse," &c., by Sir K. Digby, translated by R. White: a work which affords one of those embarrassing cases, where it is so difficult to assign the exact limit between credulity and empiricism.

* Phil. Trans. for 1699, p. 332-4. Lowthorp's Abrid. of Phil. Trans. v. iii. p. 11, 12. Sprengel, t. v. p. 10. Hutchinson's Biog. Med. v. i. p. 373-80.

† Sprengel, sect. 13, ch. 1.

‡ Eloy, "Dubois." Haller, Bib. Med. lib. ix. t. ii. p. 627 et seq. Sprengel, §. 13, ch. v. Biog. Univ. in loco.

§ Barchusen, Diss. 23, §. 15 et seq. Haller, Bib. Med. §. 685. Eloy in loco. Sprengel, t. v. p. 73-6. Aikin, in loco. Biog. Univ. in loco.

of facts, indicative of a mind of great sagacity, which enabled him to seize upon the most essential features of a disease, and to direct his attention to those points alone which tended to illustrate the nature of the morbid changes that were produced. But the great merit of Sydenham, that which has raised his reputation to so high a pitch of celebrity, and which causes his works to be still read with admiration, is the same with that which was ascribed to Hippocrates, viz. not allowing his speculative opinions respecting the nature or cause of diseases to interfere with the treatment. He carefully observed the operation of remedies on the symptoms, and the action of the various external circumstances to which the patient is exposed, and from their effect he deduced his indications. He accommodated his theory to the facts, not, as is too frequently the case, the facts to the theory. He agreed generally with Willis, in ascribing the origin of disease to certain morbid fermentations, and he conceived the primary changes to take place, not in the solids, but, according to the opinion almost universally adopted at that period, in the fluids; this, indeed, may be regarded as a necessary consequence of the assumed hypothesis.

In one important point he agreed very nearly with Hippocrates, that diseased action consists essentially in an effort of nature to remove some morbid or noxious cause, and that the great object of the practitioner is to assist in bringing about the proper crisis, and to regulate the actions of the system, so as to prevent either their excess or their defect. The practice was necessarily of a kind which, in the present day, would be styled somewhat inert, consisting rather in attempts to palliate certain symptoms, than in any attempt to counteract or remove their cause. But although we may conceive that the object in view was not always precisely what it would have been, had he not been somewhat biased by his hypothesis, the mode in which he proceeded to effect his indications is, in most cases, very judicious. We may, perhaps, venture to affirm that there are few practitioners, even in the present day, who were better acquainted with the juvantia and lædentia, who were more successful in attaining a just medium between excessive caution and undue vigour, and whose proceedings were more guided by the dictates of a sound understanding, enlightened by an extensive range of observation, and an ample store of well-digested experience.*

I have spoken of Sydenham in connection with Willis and the chymical physicians, because in many parts of his writings he adopts the hypothesis, that fermentation and other chymical changes in the state of the fluids are the primary causes of disease. Yet I have been at the same time especially careful to point out that the distinguishing merit of Sydenham consisted in his not manifesting an undue attachment to any theory, but in devoting himself to the study of disease, and the effect of remedies upon it. This merit was not unperceived by his contemporaries, and we learn that he was held by them in great respect. Yet the general spirit of the age was so entirely devoted to hypothesis and speculation, that he can scarcely be said to have made any great impression upon the general state of medical opinion, or to have materially diverted the mind from an almost exclusive attention to the theories which were then so prevalent. Indeed, with every feeling of admiration for the character and acquirements of Sydenham, it must be admitted, that he was not himself fully aware of the great principle, which is the foundation of true philosophy, as well in medicine as in every other department of science, that all theory not derived from the generalization of facts is objectionable, and almost necessarily leads to erroneous conclusions. Sydenham's natural sagacity caused him to feel the value of the inductive method, but it was more from this circumstance than from any abstract conception of its importance, that he was induced to adopt it. The state of medical science was indeed scarcely ripe for that reform which had now commenced in many other departments of philosophy. It is more a science of observation than of experiment, and the observations are of peculiarly difficult execution, depending upon the combined operation of various causes, and involving much complication in the effects, the respective proportions of which it is often extremely difficult to ascertain and to appreciate. Hence it required a more matured state of medical knowledge before we could arrive at the great truths which had been promulgated by Bacon, and which were generally recognised in the other departments of science. Although

* Haller, Bib. Med. lib. 10, t. iv. p. 188 et seq. Eloy, in loco. Sprengel, t. v. p. 566-576. Cabanis, ô. 12. Aikin, in loco; Renauldin, Biog. Univ. in loco.

mankind were aware of the importance of observation and experience, they were not sensible of their full value; and it required another century and various successive revolutions of theory, before they could be detached from the hypotheses that had been transmitted to them from their predecessors, and had been sanctioned by the authority of so many illustrious names.*

One of these revolutions was produced by the rise of a new theory of medicine, perhaps more captivating than any which had yet appeared, from its scientific aspect and its high pretensions; we allude to the doctrines of the Mathematical Physicians, or, as they have been termed, the Iatro-mathematical School. The rapid advance which had taken place in mathematical science during the latter part of the sixteenth century, and the fortunate application of it to various branches of natural philosophy, induced some of the Italians to apply it to the explanation of the phenomena of the living system. Of these, one of the first, both in order of time and of celebrity, was Borelli. He was a profound mathematician, and a man entirely devoted to scientific pursuits; and, in his well-known treatise on muscular motion, he illustrated in a very happy manner the mode in which certain functions of the body may be elucidated and explained on mechanical principles. Some of the data which he assumes are now admitted to be incorrect, and in some cases the deductions are not the fair results of the premises; but upon the whole it is allowed that he established many important points, and considerably advanced our knowledge of the animal economy. The new path of inquiry, which had been thus so successfully opened by Borelli, was soon occupied by many of his contemporaries and pupils, and, according to the usual custom on such occasions, it was carried by them far beyond its legitimate limits, and was applied to various topics with which it had little connection. One of the most active and ardent in this pursuit was Bellini, who was a professor at Pisa, and who exhibited such marks of early genius as to become a lecturer at the age of twenty. His acquirements were varied, and his talents were splendid, but they may be pronounced to be rather specious than solid, and to be more adapted to excite applause than to advance true science. The mode of reasoning which had been employed by Borelli to explain the action of the muscles, which is essentially a mechanical function, and where such reasoning was therefore appropriate, was extended by Bellini to all the functions and actions of the body, both in health and in disease. He maintained, not only that every part of the body is under the influence of gravity and mechanical impulse, but that these are the sole agents, and that we may explain all the vital functions merely by the application of the principles of hydrostatics and hydraulics.

The imposing air of the new hypothesis instantly acquired for it a number of converts, embracing many of the most learned men of the age. The body was regarded simply as a machine composed of a certain system of tubes, and calculations were formed of their diameter, of the friction of the fluids in passing along them, of the size of the particles and the pores, the amount of retardation arising from friction and other mechanical causes, while the doctrines of derivation, revulsion, lentor, obstruction, and resolution, with others of an analogous kind, all founded upon mechanical principles, were the almost universal language of both physicians and physiologists towards the close of the seventeenth century. In proportion as the Mathematical sect gained ground, that of the Chymists declined, while between the two the old Galenists may be considered as nearly extinguished. In Italy and in England the mathematical doctrines had many learned and zealous adherents; it had also some followers in France, although in that country, as well as in Holland and Germany, the chymical theory still continued to prevail.†

When we consider the very great influence which the iatro-mathematical sect exercised over the theories of their contemporaries, we may perhaps be surprised that it did not produce any very decided or immediate effect upon their practice. In fact, their reasoning was more applicable to physiology than to medicine; for

* We have an ample account of the iatro-chymical sect in Sprengel, §. 13, ch. vi.; its advocates were numerous and respectable, but few were of that distinction which entitles them to be noticed in this sketch.

† Sprengel, §. 14. Cabanis, ch. 2. §. 9. In Italy we may select, as among the most eminent of the iatro-mathematical sect, Borelli, Bellini, Castelli, and Guglielmini; in France we have the celebrated Sauvages, and in our own country Pitcairne, Charleton, Keill, Jurin, Mead, and Freind; we may remark, however, that some of these, although practitioners of medicine, are principally indebted for their reputation to their physiological writings.

while it appeared to afford a satisfactory explanation of the phenomena of muscular contraction, of the circulation, and of the other functions in which motion was concerned, it was obviously less applicable to the explanation of the obscure and secret agencies by which diseased action is either produced or removed when present. It was, indeed, frequently employed by the pathologist to explain the proximate cause of disease and the operation of remedies, but, except in a few instances, it can scarcely be considered as having had much effect upon the actual treatment. For the most part the practice that was adopted by this sect was founded upon the principles of the humoral pathology, and may be said to have been fundamentally that of the Galenists, although with considerable additions, derived from the more energetic treatment and the enlarged materia medica of the Chymists. The great advantage which the science of medicine derived from the Mathematicians was of an indirect nature, depending upon the habit of close reasoning and strict deduction, which is requisite in all mathematical inquiries, and which, although in this instance incorrect in the application, and sometimes even founded upon a fallacious basis, were detailed with much labour and ingenuity, and tended both to improve the intellectual powers of the individual, and to raise the character of the medical profession.

During this period, while the minds of men were engaged in these controversies, and while so much attention was paid to theoretical reasoning, the practical part of the science was apt to be regarded as of secondary importance. Certain individuals, indeed, among whom Sydenham may be mentioned as a most illustrious example, contributed in an eminent degree to improve our knowledge of the phenomena of disease and of the effect of remedies upon it; but it must be confessed that, for the most part, medical men were more anxious to establish their favourite doctrines than to investigate the truth, and we find that, in the account which they give of the details of their practice, they appeared to be much more influenced by the desire of assimilating their experience to the tenets of their sect, than of inquiring how far these tenets were themselves sanctioned by their experience. In some instances there is too much reason to suspect that the operation of the theoretical views of the practitioner was decidedly unfavourable. The opinion which was entertained by the chymical physicians of the nature of fever, that it depended upon an acrid state of the fluids, led to the indiscriminate use of alkalies in all cases which were considered as belonging to this class of diseases. Again, certain hypothetical opinions which were entertained by the mathematical physicians respecting the mechanical condition of the blood, caused them to employ the lancet in cases where we should now consider it as decidedly injurious. But it does not require the illustration of particular facts to prove the position, that where the theoretical views which were entertained of the nature of the disease were incorrect, and where the practitioner was guided by these views, the result must have been frequently unfavourable. Happily, however, for mankind, there were not wanting individuals who rose superior to the spirit of the age, who disregarded the controversies of the contending sects, and who followed the inductive method of studying medicine which had now been introduced into philosophy by the commanding genius of Bacon. Besides Sydenham, our own country may justly boast of the names of Morton, Mead, and Freind,* who, although not without their bias towards particular opinions, were men of superior minds, who were fully aware of the imperfection of medical science, and of the value of experience, as the means of remedying this imperfection.

* For the character and writings of these eminent physicians the reader is referred to the respective articles in Eloy and Haller, Bib. Med.

CHAPTER X.

Account of the sect of the Vitalists—Van Helmont—Stahl, his system—Hoffmann, his system, pathology, influence of his doctrines—Solidism—Baglivi—Disciples of Stahl.

While the medical world was thus divided between the rival opinions of the Chymists and the Mathematicians, a new sect was gradually rising up, which, although in its commencement it was perhaps equally remote from the principles of true science, became by successive improvements freed from many of its exceptionable parts, and finally triumphed over both the contending parties. It originated with Van Helmont, who commenced his philosophical career as a disciple of the chymical school of Paracelsus. He was a man of a powerful mind, but with a considerable mixture of enthusiasm, and even of fanaticism, who became disgusted with the Galenic mode of studying and practising medicine, and embraced the bolder and more efficacious system of the Chymists. But he made this great and essential addition to their doctrine,—that the changes which are produced in the body by its own spontaneous actions, as well as by the operation of remedies, are under the influence of a specific agent, which resides in or is attached to the living system, and to which he gave the name of *archeus*.*

It would not be easy to give any exact definition of the term, or to assign the precise meaning which was attached to it. Sometimes he seems to consider it as an abstract principle or power distinct from the material part of the universe; sometimes as a species of element, and at other times as a certain modification of matter which acquires peculiar qualities or agencies.† In consequence of his early training in the chymical school, he occasionally speaks of the archeus as a kind of ferment, and it would appear that he resolves all the operations of the living system and all the functions into certain fermentative processes effected by the action of the archeus. In short, the archeus was the convenient and never-failing aid to which he had recourse for the purpose of explaining all the actions of the system either in health or in disease; it was equally the cause of digestion and of sanguification, of fever and of inflammation. Van Helmont, both from the peculiar turn of his mind and from the course of study to which he had devoted himself, was little qualified to watch over the phenomena of disease, or to discriminate between the nice shades which so frequently serve to characterize the different morbid affections. Accordingly, it does not appear that he introduced any improvement into the practice of medicine, or indeed into any of the collateral departments; he is solely entitled to be noticed in this place as having laid the foundation for a new series of opinions, which were gradually moulded into one of the most important theories which had occupied the attention either of the physician or the physiologist.‡

Although, strictly speaking, Van Helmont must be regarded as the individual who first stated, in express terms, the great and important principle, that the living body possesses powers of a specific nature different from those which belong to inanimate matter, yet so much mysticism and error were mixed with it, that it produced little effect on the opinions of his contemporaries. Nearly half a century had elapsed after his death, during which time the physicians and physiologists were still defending the doctrines of the Chymists and the Mathematicians each against their respective antagonists, when a new impulse was given to medical theory by the appearance of the celebrated Stahl, who was born at Anspach in the

* He probably took the term from Paracelsus, who speaks of it as a new word which he had introduced into medicine; Chirurg. Mag. tract. 2. cap. 15.

† See the section of his "Ortus Medicinæ," entitled "Archeus Faber;" also Castelli's Lexicon, "Archeus."

‡ Eloy, in loco. Haller, Bib. Med. lib. 8. t. ii. p. 518 et seq. Enfield, v. ii. p. 458–60. Goulin, Enc. Méth. Médecine, in loco. Sprengel, sect. 13. ch. 3; this author gives us a very minute analysis of the writings and opinions of Van Helmont. Although his absurdities are not concealed, I conceive that the account is somewhat too favourable. Hutchinson's Biog. Med. v. i. p. 414–423. Fournier, Biog. Univ. in loco.

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year 1660. His education was almost exclusively occupied with the study of medicine. At the age of twenty-three he became a public lecturer, and from this time he bore a conspicuous rank in his profession, both as a teacher and a practitioner, during the remainder of his life. He was brought up in the principles of the chymical school, and hence his attention was early turned to the study of chymistry, in which science he effected a still greater revolution of opinion than in that of medicine. He possessed a character and disposition well adapted to become the founder of a new sect. He had great activity of mind united to great industry; he was zealous and enthusiastic, at the same time inclined to fanaticism and mystery; he was bold, confident, and arrogant, fully impressed with the importance of his own opinions, and disposed to place little reliance on those of others. His arrogance, however, probably induced him to enter upon investigations which he might not have attempted had he contented himself with following the track of his predecessors, and to his declared contempt for the learning of his contemporaries we may consider ourselves as in part at least indebted for his original speculations, and for the actual additions which he made to our knowledge. This contempt and arrogance were carried to such an extent, that he professed to set little or no value upon any of those studies that are usually associated with medicine, even that of anatomy; and he appeared to pay no regard either to the assertions or the arguments of his contemporaries, when they opposed any of his favourite doctrines. Besides his ardour in the pursuit of medical science, he appears to have had a decided turn for metaphysical reasoning, and in the formation of his theories he was probably influenced by the doctrines of Descartes, which were then embraced by many of the learned men of Europe.

Stahl saw the errors and deficiencies of both the prevailing theories; he therefore laid it down as a fundamental position, that neither chymical nor mechanical reasoning is applicable to the phenomena of life, and he consequently bestowed all his attention on the study of what he termed vital actions. These actions he refers to the operation of a principle which he styles *anima*, and which, in many respects, resembles the archeus of Van Helmont.* The basis of the Stahlian doctrine is similar to that of the Cartesian system, that matter is necessarily and essentially passive or inert, and that all its active properties or powers are derived from an immaterial animating principle, which is superinduced upon it or added to it. It is by the operation of this spiritual principle upon the material organs of the body that all the vital functions are produced, and it is on the absence or presence of this principle that the difference between living and dead matter essentially depends. Stahl observed with considerable acuteness the action which the mind exercises over the body, and he proved that these effects could not be referred either to a mere chymical or mechanical agent. This point, clear as it now appears to us, had not been distinctly recognised before his time, or rather, it may be said that the contrary opinion formed the basis of both the prevailing theories. But although he laid down this great truth, and established it by incontrovertible arguments, there is considerable obscurity respecting the nature of this immaterial or superintending agent; and when we enter upon the detail of his description, we become involved in a labyrinth of metaphysical subtilety. We are told that the anima superintends and directs every part of the animal economy from its first formation; that it prevents or repairs injuries, counteracts the effects of morbid causes, or tends to remove them when actually present, yet that we are unconscious of its existence; and that, while it manifests every attribute of reason and design, it is devoid of these qualities, and is in fact a necessary and unintelligent agent. He examined with much attention the nature of the different functions, their relation to the anima, and their dependence upon it; he endeavoured to explain the effect of organization, and the mode in which organization operates in producing these functions. In these investigations he displays considerable acuteness, and he contributed materially to advance our knowledge of the laws of vitality; but still his ideas are, in many respects, confused and indistinct, and he is more disposed to enter into subtile disquisitions respecting the nature of his supposed principle, than to examine the actual phenomena of the animal economy, and from them to deduce his general laws.†

* Physiol. sect. 1. numb. 3. sect. 13, et alibi.

† Haller, Bib. Med. lib. xi. t. iii. p. 575 et seq. Eloy, in loco. Cullen, Preface to his "First Lines," p. 12–18. Sprengel, sect. 15. ch. i. t. v. p. 195–270. Blumenbach, §. 420. Thomson's Cullen, v. i. p. 164–132. Renauldin, Biog. Univ. in loco. Cuvier, Hist. des Scien. Nat. t. i. p. 216.

Contrary to what is frequently the case, the hypothesis of Stahl had a considerable influence upon his practice. As all the actions of the system are under the control of the anima, and as the office of this principle is to preserve the system in its perfect state, the duty of the physician is reduced to the mere superintendence of its actions, generally to co-operate with its efforts, or if they should be irregular or injurious, which we are to suppose is seldom the case, to endeavour to restrain or counteract them. These views tended to repress the energy of the practitioner still more than the pathological doctrines of Hippocrates, inasmuch as the anima of Stahl was conceived to exercise a more direct influence over the operations of the economy than the φυσις of Hippocrates, which was simply a general expression of these actions, and which, according to circumstances, might be either beneficial or injurious to the system. As a specimen of the mode in which Stahl applied his theory to practice, we may select his doctrine respecting plethora. He supposed that the body had a general tendency to the plethoric state, because he observed that spontaneous evacuations of various kinds occasionally took place, and these he assumed were produced by the provident care of the anima, in order to remove a plethora which must have previously existed so as to render them necessary. An important office of the superintendent principle is therefore to produce the necessary evacuations, in order to prevent or remove this plethora, and hence it becomes the duty of the practitioner to watch over the evacuations, to promote them if too scanty, or to repress them if too abundant.*

The theory of Stahl, so far as it tended to fix the attention upon the vital actions of the system, and to overthrow the mechanical hypotheses which had so long and so generally prevailed, may be considered as having performed an essential service to the science of medicine. The appearance of metaphysical acuteness which it presented, independent of its real merits, acquired for it a degree of popularity in an age when the attention had been particularly directed to subjects of this description. It certainly produced a considerable revolution both in medical language and in medical opinions; and although Stahl had but few followers, who received his doctrines in their full extent, it was partially embraced by many of the most intelligent and learned men of that period, and it has ultimately had a great and extensive influence on the state of the science. Independently of the defects inherent in the system itself, the spirit of inquiry was now so widely diffused, and the importance of patiently investigating the phenomena of the animal economy was so generally admitted, that the merits of all theories were more strictly canvassed, and subjected to more severe examination. From the same combination of causes, a variety of rival hypotheses were produced, which tended to prevent the exclusive adoption of any one of them in preference to the rest; and the same state of things was still further promoted by the great number of medical schools, which were established in all the great cities of Europe, each of which was anxious to advance its claim to the public attention.

We have given to Stahl the great merit of having clearly perceived and decisively established the important truth, that the operations of the animal economy cannot be explained by the laws either of chymistry or of mechanics, and that we must therefore have recourse to something of a specific nature, peculiar to the living system itself. Yet, although he succeeded in pointing out the insufficiency of the existing theories, the one which he substituted in their place, the action of the superintending anima, was no less difficult to comprehend, was equally hypothetical, and equally liable to objections. His genius was not of a kind which was adapted to slow and patient investigation, and we accordingly find, that he either defends his system upon general grounds, or rests satisfied with merely pointing out the errors and deficiencies of his adversaries. A powerful and sagacious mind was still wanting, which might carefully examine into the nature and operations of the powers that exclusively belong to the living body, and, after ascertaining the facts, might generalize them, and thus deduce the correct theory. This was a process of much labour and difficulty, one which could only be accomplished by slow degrees, and which it might be expected would require the co-operation of various individuals.

Of those whom we should be disposed to regard as having mainly contributed to this gradual progression, the first in point of time, as well as of celebrity, is Hoffmann. He was the contemporary of Stahl, and his colleague in the university

* Pathol. pars ii. sect. i. mem. 2. §. 3 et alibi.

of Halle; he may be considered likewise as his rival, for although they both contributed so considerably to advance our knowledge of the animal economy, and, to a certain extent, by pursuing a similar mode of reasoning, yet they were persons of very different habits and dispositions, and attempted to attain the same object by very different means. Hoffmann was a prolix and discursive writer, whose collected works occupy many folio volumes, and the very titles of which, as detailed by Haller, extend to no less than thirty-eight quarto pages.* It must therefore be supposed that they contain much that is of little value, and exhibit many marks of the hasty manner in which they were composed. Yet he appears to have been a diligent observer and collector of facts, and therefore, notwithstanding the repulsive aspect of his works, they are highly estimated and frequently referred to. He attended much more to the details of practice than his colleague, and, indeed, the basis of his great work, "Systema Medicinæ Rationalis," is essentially practical, in which his physiological and pathological doctrines are, for the most part, introduced in an incidental manner, as supporting or elucidating his practical observations. Of the nature or details of his practice it will not be necessary to enter into any minute examination. It did not differ very materially from that of his contemporaries, although the circumstance of his being less exclusively attached to any single hypothesis has rendered him more disposed to take a candid and unprejudiced view of the various points which would necessarily fall under his observation. In his leading doctrines he must be classed with the mathematical physicians, but at the same time he adopts many of the opinions of the Chymists, and indeed not unfrequently derives his indications from the supposed chymical condition of the fluids. But the great and important addition which Hoffmann made to theory, both medical and physiological, is the distinct manner in which he refers to the operations of the nervous system, and its influence on the phenomena of life. Many of the actions which Stahl ascribes to the action of his hypothetical principle, the anima, Hoffmann explained by referring them to the nervous influence, a physical power no less real than that of gravity or chymical affinity, but of a specific nature and operating by its own laws, the knowledge of which is to be acquired by observation and experiment.†

But whatever merit Hoffmann may have had as a practitioner, his reputation with posterity must principally rest upon his merits as a pathologist. Although, as we have stated above, he considered the fluids to be occasionally the primary seat of disease, yet in most cases he conceives it to originate in an affection of the solids. In order to explain this affection, he assumed that what he terms the moving fibre possesses a certain degree of action or tone, which constitutes its natural state, and is necessary for the performance of its functions. Various circumstances, as well external as internal, were supposed either to increase or diminish this tone; if it were increased beyond its true limit, the state of spasm is the result; if it were unduly diminished, the contrary state of atony was produced. This celebrated theory, which, under various modifications, entered so largely into the speculations of most of the pathologists of the seventeenth century, cannot be maintained in all its parts as it was detailed by Hoffmann; it must, however, be admitted that it made a considerable approach to a correct view of the subject, and that it may be regarded as the germ from which the more mature doctrines of his successors immediately emanated. It has been supposed that he borrowed it from the constricted and relaxed fibre of the ancients; but even if we admit that this may have furnished him with the first hint, it was so far new-modelled and extended by him as to deserve the merit of originality.‡

This hypothesis of the nature of the moving fibre, together with the more extensive influence which the nervous system was imagined to exercise over the various operations of the animal economy, may be considered as forming the basis of both the physiology and the pathology of Hoffmann. Unfortunately for the fame of this writer, in consequence of the multiplicity of his works, and the hasty manner in which they were composed, it is very difficult to obtain a consistent or connected view of his theory; but, upon the whole, I conceive that he is entitled to the merit of having materially advanced our knowledge of the laws of the ani-

* Haller, Bib. Med. t. iii. p. 536–576.

† Thomson's Cullen, p. 195, 6. Cuvier, t. i. ubi supra.

‡ Cullen, in the preface to his "First Lines," bears ample testimony to the value and importance of Hoffmann's physiological speculations, and acknowledges the use which he had made of them in the formation of his own hypotheses.

mal economy, and still more, of having pointed out the track which might be successfully pursued by others for the further advancement of this knowledge. With respect to the works of Hoffmann it may be further remarked, that as in the course of his experience he gradually enlarged and corrected his pathological doctrines, and continued to publish them from time to time in detached portions, but without giving them in a condensed or abstracted form, we frequently meet with what appear to be inconsistencies and contradictions, and are obliged to collect his opinions rather from inferences and from indirect remarks, than from any clear and explicit statement of them.*

In giving an account of the pathology of Hoffmann, I have somewhat anticipated an important point of medical theory to which we must now revert. I have had occasion in various parts of this history to notice, that through all the succession of opinions, from the time of Hippocrates to the period at which we are now arrived, with a very few exceptions, the hypotheses were all founded upon the humoral pathology. This opinion was maintained equally by the Mathematicians, the Chymists, and the Metaphysicians. The changes that were produced in the system, whether mechanical or chymical, were equally supposed to take their origin from the fluids, while the Metaphysician imagined that it was upon the fluids that his immaterial superintending principle exercised its action. We may regard the publication of Glisson's treatise, "De Ventriculo et Intestinis," which appeared in 1671, as having laid the foundation for the change of opinion which afterward took place respecting this doctrine. It was in this work that the hypothesis of muscular irritability was originally brought forward, a specific property, which is supposed to be attached to the living fibre, and from which is deduced its peculiar power of contraction.† But the first writer who systematically opposed the theory of the humoral pathology was Baglivi. He was born near the conclusion of the seventeenth century, and after rising to early eminence in his profession, and acquiring a high reputation for his sagacity in the treatment of disease, and for the assiduity which he displayed in the acquisition of medical knowledge, was prematurely cut off at the age of thirty-four.‡ He proceeded upon the Hippocratean plan of watching attentively and accurately describing the phenomena of disease; but he differed from him as to their primary seat, rejecting the principles of the humoral pathology, and placing the causes of them in the altered condition of the solids. His account of the nature of the solids, and the actions of what he terms the moving fibres, is by no means conformable to our modern notions on the subject, and may be pronounced to be incorrect; but the opinion that the fluids are affected secondarily, in consequence of a previous affection of the solids, was a great and important point of theory, which has been gradually gaining ground since the time that it was first promulgated by Baglivi, and may be regarded, with certain modifications, as the current hypothesis of the present day. The doctrine of solidism had, indeed, no direct or immediate effect upon the practice of medicine, but by drawing the attention more to the state of the muscular and nervous systems than to that of the fluids, it tended to correct many of the erroneous opinions which had previously prevailed respecting the actual condition of the system when labouring under disease, and in this way powerfully contributed to improve our knowledge of the relative state of the different parts of the animal economy, and of the operation of remedies upon it. The gradual subversion of the humoral pathology may also be regarded as a remote cause of the favourable reception with which the doctrines of Hoffmann were received, while the attention which he paid to the action of the nervous system contributed, in its turn, still further to favour the theory of solidism, in opposition to that of the humoral pathology.

The theory of Stahl, notwithstanding its defects and inconsistencies, was calculated to make a considerable impression upon the public mind at the time when it was advanced, and it accordingly met with numerous supporters. It clearly pointed out the inadequacy of all the previous hypotheses, founded merely

* Haller, Bibl. Med. lib. x. §. 877. t. iv. p. 536 et seq. Nouv. Dict. Hist. in loco. Eloy, in loco. Cullen, preface to his "First Lines," p. 18–25. Sprengel, sect. 15. ch. 2. Blumenbach, §. 419. Goulin, Enc. Méth. Médecine, in loco. Thomson's Life of Cullen, v. i. p. 182–200. Biog. Univ. in loco. Of his works the following may be selected as the most original and valuable:—Systema Medicinæ Rationalis; Medicina Consultatoria; Opuscula Med. Phys.; Consult. et Respons. Cent.; Phathologia Generalis; Therapia Generalis; Semeiologia; Philosophia Corporis hum. vivi.

† See especially the fifth chapter of the treatise entitled "De fibris in genere." Eloy, in loco.

‡ Eloy, in loco. Haller, Bibl. Med. lib. xii. §. 954. t. iv. p. 197 et seq. Goulin Encyc. Méth. Médecine, in loco. Chaussier et Adelon, Biog. Univ., in loco.

on mechanical principles, to explain the phenomena of vitality, while it was powerfully recommended by its simplicity; and perhaps even its metaphysical aspect might render it not the less acceptable to his countrymen, who were deeply interested in the speculations of Leibnitz, and the controversy to which they had given rise. It was not, indeed, generally embraced in its full extent; but with certain modifications it remained the favourite doctrine with many of the Germans, until it was gradually superseded by the more correct views of Hoffmann, and still further by the powerful and commanding genius of Haller.

Of the followers of Stahl, who adopted his opinions with the fewest alterations, we may select the names of Juncker and Alberti, who were both of them professors in the university of Halle, of which they contributed for many years to support the reputation which it had acquired under their illustrious predecessors. They were both of them voluminous writers, and they devoted a considerable part of their labours to expounding and illustrating the principles of the Stahlian system. But their works being more theoretical than practical, and being intended rather for the purpose of defending certain opinions than for the acquisition of knowledge, are now sunk into oblivion, or are merely referred to as historical records of an hypothesis which formerly engaged so much attention.

With these remarks on the theory of the Vitalists I shall close the review of the state of medical science during the sixteenth century. Up to this period I have adopted the chronological arrangement, and by pursuing this method have been enabled without difficulty to trace the successive stages of the progress of our art. But, as we approach nearer to our own times, the number of subjects which claim our notice are so multiplied, that it will be necessary to continue the historical sketch upon a different plan. Disregarding therefore, to a certain extent, the mere order of time, I shall, in succession, give an account of those individuals who have acquired the greatest degree of celebrity, endeavouring at the same time to class them according to the opinions which they adopted, pointing out their connection with each other, and with the general state of medical science.*

CHAPTER XI.

Introductory remarks—General progress of medical science—Boerhaave, character of his writings, his pathology—Gaubius—Gorter—Haller, his character, pathological doctrines, his disciples, his opponents—Whytt—Semi-animists—Sauvages—Cullen, his pathology and practice, his pupils—Brown, his system—Darwin, his system.

From the revival of letters to the commencement of the eighteenth century, including a period of between two and three hundred years, the great aim and object had been to apply to medicine the same scientific principles which had been found successful in the advancement of the other departments of philosophy. The most distinguished medical writers of that period had therefore employed themselves rather in collecting opinions and in reasoning upon them, than in examining into the grounds on which these opinions had been formed, or inquiring in what degree they were applicable to the explanation of the phenomena of the animal economy. For the most part, as I have had occasion to remark, they failed in their direct object; at the same time, however, a considerable body of information was gradually acquired, and the views which now began to be unfolded in consequence of the pathological speculations of Hoffmann, and the practical observations of Sydenham and the modern Hippocrateans, led to the establishment of the

* It may be necessary to observe that I have already somewhat deviated from the chronological arrangement in considering Hoffmann and Stahl as belonging to the seventeenth century, although it was not until near the close of it, in the year 1693 and 1694, that they entered upon their office as professors at Halle. But by admitting of this irregularity, I have made the division to correspond more nearly with the changes which took place in the state of medical science.

same spirit of inductive investigation in medicine which had been for some time adopted in the other departments of natural science. We have passed over the age of mere learning, and we now enter upon that of observation and experiment. Scholastic disquisitions were completely disregarded, abstract theory was rapidly falling into disrepute, and hypotheses were no longer considered as deserving of attention, unless they professed to be derived from the generalization of facts. The necessary result of this state of things has been to detach the mind from the arbitrary influence of theory, to diminish the authority of great names, and to induce the inquirers after truth to rest more upon their own exertions, than upon the authority of others. We have, indeed, still to lament the errors and perversions of the human mind, to witness the attempts of ignorance and arrogance to usurp the place which is due to modest desert and patient research; but such attempts, for the most part, have obtained only temporary success, and after an ephemeral celebrity have been consigned to their merited contempt. In the mean time notwithstanding these occasional interruptions, the progress of knowledge has been rapidly and steadily advancing. Experiments, well contrived and patiently conducted, have been performed in every department of physiological and medical science; observations have been made with more minuteness and recorded with more accuracy; our improved knowledge of chymistry has enabled us to introduce the most important reforms into pharmacy, while the discovery of various new articles of the materia medica has given us additional and powerful means of opposing the progress of disease.

While Stahl and Hoffmann were promulgating their doctrines in the university of Halle, the celebrated Boerhaave was teaching medicine with equal zeal, and, we may venture to say, with more success, at Leyden.* Boerhaave was originally educated for the profession of theology, but owing to some doctrinal scruples he fortunately relinquished his intention, and devoted himself to the study of medicine in all its branches. There are few examples, either in ancient or modern times, of any individual who arrived at higher eminence, both in general knowledge and in the departments more immediately connected with his profession. His acquaintance with botany and with chymistry were such as to enable him to teach both these sciences with the greatest success; while his lectures and his writings on medicine, both theoretical and practical, were long considered as standards of excellence. He had a mind and character peculiarly well adapted for his situation and the age in which he lived, when a variety of new facts and new hypotheses were brought into view, and when it required a consummate degree of judgment to weigh the opposing evidence, and decide between the merits of the contending parties. His moral qualities were no less admirable than his intellectual acquirements; and if we add to these his elegance as a writer, his eloquence as a lecturer, and his entire devotedness to his profession, we shall be at no loss to account for the celebrity which he enjoyed during his lifetime, and the reputation which he left behind him.

Boerhaave has been compared to Galen, and it may be asserted that he will not lose by the comparison. If Galen possessed more genius, Boerhaave possessed more judgment; while in their scientific acquirements, and in the extent of their information, it would not be easy to decide between them. They were both eminently skilled in the art of availing themselves of the knowledge of their contemporaries in all the branches of science, of applying it to the elucidation of their particular department, and of modelling and combining into a well-digested system all the scattered materials which they obtained from so great a variety of sources. In the stability of their systems, however, we observe a remarkable difference; for while Galen's doctrines were implicitly adopted for many centuries, the system of Boerhaave, notwithstanding its real merits and the applause which it obtained during the life of its inventor, shortly after his death was assailed from numerous quarters, and was unable to maintain its ground. The age in which Boerhaave lived was not one of authority, but of investigation, and the enlightened spirit which pervades his own works tended, in no small degree, to foster that taste for inquiry which led his contemporaries not to rest satisfied with his theories, however beautiful might be their aspect, and however happily they might appear to explain the phenomena of life, if they were found to be based upon principles which were themselves conjectural and gratuitous.

* Boerhaave was elected to the chair of medicine in 1709.

The great object of Boerhaave, in the formation of his system, was to collect all that was valuable from preceding writers, and by means of these materials to erect a system which should be truly eclectic. The basis of his doctrines is, in a great measure, mechanical, derived from the hypothesis of Bellini and Pitcairne; but he unites with this certain parts of the humoral pathology, and adopts some of the opinions of Hoffmann. To these he added various original observations, by which he has given ample proof of his talents as a sagacious practitioner. His language is remarkably perspicuous, and his reasoning, if we admit his premises, is fair and conclusive. But the grand error of Boerhaave consisted in his depending more upon opinions than upon observations; in his endeavouring to form a system which should be composed of the united speculations of others, rather than to ascertain the correctness of the principles from which these speculations were deduced. His system accordingly met with the fate of all such as are built upon hypothesis; it could not stand the test of experiment and observation, and, notwithstanding the efforts of some of Boerhaave's pupils, who were zealously attached to their master, it was generally discarded in no long period after the death of its inventor. But although the system of Boerhaave may have yielded to the more perfect and enlarged theories of his successors, he must ever be regarded as one to whom the science of medicine is deeply indebted. His Institutions and his Aphorisms would alone serve to immortalize his reputation as a correct observer and a sagacious practitioner; and if we compare them with any contemporary performance, which is the fair method of judging of the merits of the works of science, we cannot fail to recognise their own superiority.*

In forming his system, Boerhaave was not unmindful of the doctrines of Hoffmann, and particularly of the influence which the brain and nerves exercise over the operations of the animal economy. But although he introduces it on certain occasions, and in some instances allows it to act a prominent part,† yet he was by no means fully aware of the extent of its power. This indeed may be considered as the radical defect of his pathological doctrines; he regards the solids too much in the light of mere mechanical agents, without sufficiently taking into account those properties which specifically distinguish them from inanimate bodies. This deficiency was, to a certain extent, supplied by his nephew Kauw Boerhaave,‡ and by his favourite pupil and successor Gaubius,§ who introduced the agency of the nervous system in many cases where it had been omitted by Boerhaave himself. They were both of them men of considerable talents and acquirements, and the improvements which they made in medical theory were of real value. The writings of Gaubius, especially his Nosology and his Institutions of Pathology, were long held in high estimation, and were employed as text-books in the medical schools.‖ In the same connection we may mention the name of Gorter, an eminent professor and practitioner of Harderwyc, who, while, like Boerhaave, he adopted the essential parts of the mechanical theories of his predecessors, made considerable use of the agency of what he termed the vital force in explaining many of the operations of the animal economy.¶ The writings of Gorter are very numerous, and prove him to have been an industrious cultivator of medical science, while his great practical work, entitled "Compendium Medicinæ," indicates a talent for correct observation, and an accurate discrimination of morbid symptoms.

But the great support and ornament of the Boerhaavian school was Van Swieten. He was born at Leyden in the last year of the seventeenth century, and was one of the most favoured and meritorious of the pupils of Boerhaave. In consequence of his theological opinions not coinciding with those of the state religion, he was expelled from the university of his native city, in which he held a professorship, and accepted an invitation from Maria Theresa to the court of Vienna. Here honours and distinctions of all kinds were heaped upon him; but these he amply

* Haller, Bib. Med. lib. xii. t. iv. p. 142 et seq. Eloy, in loco. Cullen, Preface to his "First Lines," p. 25–35. Hutchinson's Biog. Med. v. i. p. 82 et seq. Nouv. Dict. Hist. in loco. Thomson's Life of Cullen, v. i. p. 200–217. Blumenbach, Introd. §. 418. Goulin, Encyc. Méth. Médecine, in loco. Biographie Universelle in loco.

† See particularly his work entitled "Prælectiones de Morbis Nervorum."

‡ Thomson's Cullen, v. i. p. 219. § Ibid. v. i. p. 220.

‖ Haller, Bibl. Anat. t. ii. p. 166, 7. Eloy, in loco. Aikin's Gen. Biog. in loco. Thomson's Cullen, v. i. p. 220, 1. Desgenettes, Biog. Univ. in loco.

¶ Eloy, in loco. Haller, Bibl. Anat. t. ii. p. 169, 70. Sprengel, t. v. p. 314–16. Thomson's Cullen, v. i. p. 218. Renauldin, Biog. Univ. in loco.

repaid by the unremitting attention with which he devoted himself to the medical school of that metropolis. Of the high reputation which it has since enjoyed he may be said to have laid the foundation, while, by the publication of his Commentaries on the Aphorisms of Boerhaave, he demonstrated, at the same time, the high respect which he retained for his preceptor, and the extent of his own information on all subjects connected with medical science. The Commentaries of Van Swieten contain a large and valuable collection of practical observations, partly the result of the author's own experience, and partly derived from his extensive knowledge of books. He adopted the theory of Boerhaave with little alteration, and in this respect the work must be regarded as fundamentally defective; but the great body of facts which it contains, detailed as they are in a clear and perspicuous style, will always ensure it a place in the library of the medical student.*

The intimate acquaintance which subsists between the doctrines of pathology and an acquaintance with the laws of the animal economy in its healthy and perfect state, makes it necessary for me to give some account of an individual, who, although not a practitioner of medicine, contributed perhaps more to our knowledge of the nature of disease than any one who has hitherto passed under our review. I refer to the great name of Haller, who has been not unaptly termed the father of modern physiology. He was the pupil of Boerhaave, and imbibed from him his thirst for knowledge, his correct judgment, his undeviating candour, his unblemished integrity, and, in short, all the intellectual and moral qualities which we have admired in the professor of Leyden. But to these qualities Haller added a more extensive and original genius, which led him never to rest upon the unexamined opinions of others, and a clearness of conception, which taught him, both in his language and in his mode of reasoning, to avoid all ambiguous and undefined terms, and all irrelevant arguments. He possessed a mind at the same time comprehensive and correct, equally adapted for discovering new paths to knowledge, and for investigating those which had been previously entered upon by others. The innate powers of the components of the body, which had been imperfectly seen by Glisson and by Hoffmann, were examined by Haller with his characteristic acuteness, and the result of his long and well-directed experimental research was rewarded by the establishment of his theory of irritability and sensibility, as specific properties attached respectively to the two great systems of the animal frame, the muscular and the nervous, to which, either separately or conjointly, may be referred all the phenomena of the living body. But perhaps a still more important service which Haller rendered to science was the example which he held out of carefully abstaining from all opinions founded merely upon speculative grounds, and of deducing his general principles exclusively from experiment and observation. He gave an impulse to science no less by the actual discoveries which he made, than by the spirit with which he conducted his researches, so that we may regard the publication of his Elements of Physiology as having introduced a new era into medical science.† •

It would be incompatible both with the immediate subject of this essay, and with the limits to which it is necessarily restricted, to give a detailed account of the controversies and discussions to which the theory of Haller gave rise. Notwithstanding its merits, and the evidence by which it was supported, it was opposed, either in its full extent or in certain of its parts, by many individuals of high respectability; while, on the contrary, various experiments were instituted, by which his conclusions were confirmed and his principles extended. Among those who were the most successful in these researches I may select the names of Zimmerman,‡ Caldani,◊ Fontana,‖ Tissot,¶ Zinn,** and Verschuir. The last of these physiologists particularly distinguished himself by his experiments on the contractility of the arteries,†† a point which had been left undecided by Haller, but which formed a most important addition to the theory of the action of the vessels, and which had previously been rather assumed as what was probable, than deduced from any ascertained facts.

* Eloy, in loco. Nauche, Biog. Univ. in loco.

† Elye, Mém. Acad. Scien. 1777. Henry's Life of Haller. Sprengel, sect. 15, ch iii, Aikin's Gen. Biog. in loco. Thomson's Cullen, v. i. p. 221-240. Cuvier, Biographie Universelle, in loco. Dewar, Brewster's Encyc. art. "Haller." Blumenbach, Introd. §. 468. Goulin, Enc. Méth. Médecine, in loco.

‡ De Irritabilitate. ◊ Instit. Physiol. ‖ In Haller, sur la Nature Sens. et Irrit. t. iii.

¶ In Haller, sur la Nature Sens. et Irrit. t. iii. ** Exper. circa Corp. Cal. etc.

†† De Arter. et Ven. Vi Irrit.

Whytt and Porterfield may perhaps be considered as the most powerful of the opponents of Haller. They were natives of Scotland, and during the earlier part of the last century, were residents in the metropolis of that kingdom, and bore a conspicuous part in the scientific institutions for which it was so justly celebrated. The former of them was professor of medicine in the university of Edinburgh, at the time when it was rapidly advancing to that high reputation which it afterward more fully attained, under the genius of his illustrious successor Cullen. They opposed that part of the theory of Haller which ascribes all the actions of the living system to certain powers necessarily connected with the material parts of the frame, as well as to the separation of these actions into the two distinct powers of irritability and sensibility.* The controversy which Whytt carried on with Haller was conducted with acuteness and ability, but it manifests a degree of acrimony which it is impossible not to regret, particularly as occurring in an individual who was otherwise so much entitled to our respect. And this is more especially the case when we consider the nature of the objections which he urged against the Hallerian hypothesis, which were rather of a metaphysical nature, than such as were either founded upon experiment or deduced from observation. His doctrine of the vital motions of the body, which formed the principal subject of the controversy, may be regarded as intermediate between that of Haller and Stahl, or rather compounded of the two. He attributes these vital motions to the operation of the sentient principle, which is supposed to be something distinct from the corporal frame, at the same time that it is necessarily attached to it, and is under the influence of physical causes, not like the anima of Stahl, acting by a species of independent consciousness and volition. The great error which pervades the speculations of Whytt and Porterfield consists in their reasoning more upon metaphysical than upon physical principles, and in their assuming certain powers, the proof of which rests more upon their supposed necessity to account for the actions of the system, than upon any independent evidence that we have of their existence. They did not, indeed, like the Stahlians, consider the sentient principle as something independent of the body, and only, as it were, appended to it, but as a principle or power necessarily belonging to the living body, and imparting to it its vitality, although essentially distinct in its nature from any of the properties of a mere material agent. Whytt may be regarded as the founder of the sect which obtained the name of the Semi-animists, which, under various modifications, included some of the most distinguished physiologists both in this country and in France. Of the latter, one of the most eminent was Sauvages; he was a native of Languedoc, and received his education at Montpellier, which, during the early part of the eighteenth century, held a very high character as a school of medicine. In 1734, he was appointed one of the professors in the university of that city, and during the remainder of his life contributed materially to maintain its credit by his talents both as a writer and a teacher. His reputation with posterity will principally rest upon his Methodical Nosology, a work which contains an arrangement of diseases into classes, orders, genera, and species, on the same plan which had been employed in the arrangement of the subjects of natural history. The Nosology of Sauvages is a work of great and original merit, which, although now in some degree superseded by the improvements of later writers, mainly contributed to the advancement of medical knowledge by producing accuracy in the use of terms and in the discrimination of the characters of disease.†

The same kind of service which Haller rendered to the science of physiology was performed for that of the practice of medicine by his contemporary Cullen. Among those who have made the study of medicine their professed pursuit, no one, since the revival of letters, has risen to greater eminence during his lifetime, nor has left behind him a higher reputation than this celebrated individual. During the greatest part of a long life he was engaged in the teaching of medicine or some of the collateral sciences, first in the university of Glasgow, and afterward in that of Edinburgh, which latter he contributed, in no small degree, to raise to the rank which it long held, of the first medical school in Europe. His peculiar excellence as a lecturer afforded him an ample opportunity of promulgating and enforcing his doctrines, while their real merit, no less than the mode in which they were announced, rendered them in the highest degree popular among his

* See particularly Whytt on Vital and Involuntary Motions, and Physiological Essays. Porterfield on the Eye, passim, and papers in Edinburgh Medical Essays. Thomson's Cullen, v. i. p. 241-258.

† Eloy, in loco. Haller, Bib. Anat. "Boissier," t. ii. p. 300–4, §. 999.

pupils and contemporaries. He possessed an acute and ardent mind; he was well skilled in the medical literature both of the ancients and the moderns, but he had no undue respect for the opinions of others on the mere ground of authority. He detected the defects of former hypotheses with shrewdness and sagacity, while he proposed his own views with a degree of candour and modesty, which tended to render them the more acceptable, and disposed his audience to receive them in the same spirit with which they were proposed.

With respect to his physiological writings, they afford, in some respects, a remarkable contrast to those of Haller; for while the latter are extended to a great length, and are filled with the most minute and elaborate details, the former are no less remarkable for their compressed brevity, consisting principally in general views and abstracted deductions. Contrary, however, to what is so frequently the case with respect to works of this description, they are not to be regarded as mere speculative positions, but as the condensed result of patient research and extensive observation. Some of the leading doctrines of his pathology were professedly borrowed from Hoffmann; but to these he made many important additions, by taking advantage of the various improvements that had been made in physiological knowledge, principally by means of Haller and his pupils. Still later discoveries in this science, and in that of chymistry, have indeed proved that certain parts of his system are not tenable, and that others require to be considerably altered and modified; but it may be asserted, that no one produced a more powerful and lasting effect upon the state of medicine, in all its branches, both theoretical and practical, than Cullen. But his great and appropriate merit, and which entitles him to the admiration and gratitude of posterity, is the sagacity and diligence which he manifested in the description and discrimination of the phenomena of disease. In this talent he may be considered as rivalling Sydenham, or any of his most distinguished predecessors, while the recent improvements in physiology and the other branches of medical science gave him an advantage which he did not fail duly to improve. In his treatment of disease he manifested no less judgment and sagacity than in the formation of his theories. He was prompt and decisive, without rashness; he estimated the powers of remedies by a cautious and accurate examination of their effects, with little bias from hypothesis, and with even somewhat of a skeptical disposition of mind, which prevented him from falling into those errors and inconsistencies to which the practice of medicine is so peculiarly obnoxious.

In giving an account of the system of Boerhaave, we remarked that in its formation he proceeded upon the eclectic plan, founding it upon the opinions of others, which he endeavoured to connect together, and to mould into a consistent and uniform theory. Cullen adopted the more philosophical mode of generalization and induction. He disclaims all hypotheses and theories not derived immediately from facts, and made it his great business to collect, by actual observation, the materials from which he might deduce his general principles. In this object he was eminently successful, and it is this which gives his writings their great value, a value which they must ever retain, amid all the revolutions of opinion, which attach to medicine more than to any other branch of science. But, although he was so sensible of the advantage of the inductive mode of investigation, he was not a mere empirical practitioner, who disregarded all theoretical reasoning, and never ventured to go beyond the simple result of experience. On the contrary, he inquires in all cases into the remote and primary causes of disease, and endeavours to deduce from them his indications of cure. Many of his individual speculations are indeed remarkable for their subtilty and refinement, and may be characterized as exhibiting more ingenuity than judgment. At the same time it is not a little remarkable, that these speculations, however carefully they were elaborated, had but little influence on his practice; and it is gratifying to observe with what caution he applies his hypothesis to explain or direct his method of treating disease.

His great work, entitled, "First Lines of the Practice of Physic," is the one on which his reputation will principally rest; but the merits of his Institutions, of his Nosology, and of his Lectures on the Materia Medica, are each of them sufficient to have entitled him to a distinguished rank among the improvers of medical science. The last of these works, in which he takes a more philosophical view of the operation of remedies than had been done by any of his predecessors, is one of peculiar value. It contains a great variety of important pathological observations, together

with a complete theory of therapeutics, and being the latest of his publications, we find in it his more matured and corrected views on many topics which had been treated in his former works. In none of them do we find more of that spirit of rational skepticism to which I have alluded above, and which led him to be more confident in opposing the opinions of others than in maintaining his own. Like Haller, with whom I have already taken occasion both to compare and to contrast him, he contributed to introduce into medical reasoning a philosophical spirit, which has produced a permanent and highly salutary effect upon the healing art, and which associates the name of Cullen with those of the great benefactors of the human race.

It is not easy to give, in a short compass, an account of the pathological doctrines of Cullen, because they consisted rather of a number of individual parts, as applied to the explanation of particular phenomena, than of one comprehensive system, which constituted a general theory of diseased action. The foundation of the system is, however, sufficiently simple; that the living body consists of a number of organs, which are all of them possessed of powers of a specific and appropriate nature, distinct from those which are attached to inanimate matter. These powers are so ordered that they have a tendency to preserve the whole machine in a perfect state, when its actions and functions proceed in their ordinary course. When any irregularity supervenes, either from internal or external causes, if it be not in an excessive degree, the self-regulating principle is sufficient to control the operation of the morbid cause, and to restore the system to its healthy condition. This regulating principle, or, as it was termed, the *vis medicatrix naturæ*, differs essentially from the archeus of Van Helmont or the anima of Stahl, inasmuch as it is supposed not to be any thing superadded to the body, but one of the powers or properties necessary to its constitution as a living system, and the existence of which is recognised by its effects. Although the laws of gravity and of chymical affinity affect the animal body, so far as it is composed of material organs, yet its appropriate actions are under the immediate influence of the specific laws of vitality. Hence all explanations, depending upon mere mechanical or chymical reasoning, were abandoned, and in their place was substituted the vital action of the parts, and more especially that of the extreme branches of the arterial system, or, as they are styled, the capillary arteries. Although it may appear that both Stahl and Hoffmann had, to a certain extent, preoccupied the ground which was taken by Cullen, as to the foundation of his system, and although the system, as detailed by him, is defective in some of its subordinate parts, yet we must admit, that the ample and explicit manner in which it was stated gave it the aspect and much of the merit of novelty, while the applications which he made of it were frequently just, and always ingenious. His physiology and his chymistry were not in all cases correct; he did not pay sufficient attention to the distinction between the powers of the muscles and the nerves, which had been so well discriminated by Haller, and he even confounds their physical structure. But, with all these abatements, we still regard the pathology of Cullen with much respect, and consider him as one of those who greatly contributed to improve the science no less than the practice of his art.*

What may be termed the Cullenean school of medicine, including both his numerous pupils and the writers who either embraced his peculiar opinions or adopted his method of investigation, comprehends a large portion of the most distinguished of the British physicians during the remainder of the eighteenth century. The rational empiricism, as it has been styled, which he so firmly established, both by precept and example, has, in this country at least, so far superseded the taste for mere speculation and hypothesis, that we are, perhaps, disposed to run into the opposite extreme, and to undervalue all attempts to investigate the abstract principles of pathology, and to employ ourselves solely in the

* For a minute detail of the opinions of Cullen, and those of his immediate predecessors and contemporaries, the reader is referred to the learned and ample work of Dr. Thomson, which may be characterized as containing a philosophical history of medicine and pathology during the beginning and middle of the eighteenth century. The account which is given of Cullen's pupils must be perused with much interest—an interest which, in the case of the writer of this work, is exalted by the sacred sentiment of filial piety: p. 461, 644-6. I conceive that Sprengel, t. v. p. 359-366, in criticising the doctrines of Cullen, is somewhat deficient in that candour for which he is, in most cases, so conspicuous. See also Encyc. Brit in loco; Aikin's Gen. Biog. in loco; Kerr, Brewster's Encyc. art. "Cullen."

accumulation of facts, without duly attending to the general conclusions that may be deduced from them.*

We have, however, to notice one singular exception to this remark, where an hypothesis was advanced, of the most bold and lofty pretensions, disdaining the support of facts and experience, and professing to explain all the phenomena of life and of disease by a few simple aphorisms. In tracing the history of science, although it is proper, for the most part, to estimate books and opinions solely by their intrinsic merit, without any regard to the personal character of the author, yet we find them, on some occasions, so intimately connected, that it is impossible altogether to separate them. This is the case with the celebrated Brown, whose theory appears to have originated as much from spleen and disappointment, and a determination to oppose the doctrines of Cullen, as from a more legitimate motive.

Neither the education of Brown nor his natural character were of the kind the best adapted for the prosecution of medical science. He was originally destined for the ecclesiastical profession; and when he afterward entered upon that of medicine, he never devoted himself to those elementary studies which are indispensably necessary to a correct knowledge either of theory or of practice. But what he wanted in knowledge he endeavoured to supply by the force of his own genius; and by meditating upon a few general or abstract principles, he ventured to form a new system of pathology, which he announced with a degree of confidence that, while it exhibited the strong powers of his understanding, proved no less the deficiency of his information. Medicine, which had hitherto been a conjectural art, was now to be built upon a few certain and fixed principles, which, by superseding all that had been previously written upon the subject, and by being independent both of observation and of experience, required for its attainment little previous study or learning. The novelty of the attempt, the easy access which it promised to a science which before appeared of difficult approach, and the plausibility of some of its leading positions, acquired for the new theory a prodigious degree of popularity in the university of Edinburgh, where it was first promulgated. Brown had been, in the first instance, patronised by Cullen; but, from some causes, both of a personal and a professional nature, which it is not difficult to comprehend, he forfeited the good opinion, and became the bitter antagonist of the doctrines of his former friend. The controversy to which this schism gave rise was carried on for some years with great vehemence, and was by no means confined to the place where it originated. In this country the Brunonian system obtained many adherents when it was first proposed, principally, indeed, among the students or younger members of the profession; while in some parts of the Continent, more especially in Italy, it was adopted by men of learning and science, and became the prevailing hypothesis in some of the most respectable medical schools.

The general principles of the theory are few and simple. He assumed that the living body possesses a specific property or power, termed excitability; that every thing which in any way affects the living body acts upon this power as an excitant or stimulant; that the effect of this operation, or excitement, when in its ordinary state, is to produce the natural and healthy condition of the functions; when excessive, it causes exhaustion, termed direct debility; when defective, it produces an accumulation of excitement, or what is termed indirect debility. All morbid action is conceived to depend upon one or other of these states of direct or indirect debility, and diseases are accordingly arranged in two great corresponding classes of sthenic or asthenic; while the treatment is solely directed to the general means for increasing or diminishing the excitement, without any regard to specific symptoms, or any consideration but that of degree, or any measure but that of quantity. Such general views and sweeping doctrines, however alluring to the uninformed

* In this brief sketch I can do no more than merely mention the names of some of our countrymen who, either by the publication of single cases, or of monographs on certain diseases, have contributed to the advancement of pathological or practical knowledge. Among others we may select those of Gregory, the able successor of Cullen, Pringle, M'Bride, Huxham, Fothergill, Cleghorn, Brocklesby, Lind, and Russel. In our own times, we have had the no less illustrious names of the Hunters, of Percival, Withering, Johnstone, Falconer, Heberden, Baillie, Haygarth, Ferriar, Currie, Willan, Bateman, Marcet, and Parry. In mentioning the name of Gregory, I must be allowed to express the sentiments of respect and regard which I have always felt for my preceptor. The elegance of his literary taste, his clear and comprehensive judgment, and more especially the interesting mode in which he conveyed his instruction, all contributed to render him one of the most distinguished ornaments of his profession.

or the mere theorist, are altogether inapplicable to practice; and it is a subject for our admiration how they could be for a moment entertained by any one who had studied the phenomena of disease, or who was acquainted with the intricate and complicated relations of the different functions and actions of the living system. Accordingly, in this country, where, in consequence of the prevalence of the Cullenean school, the attention was more directed to practical than to theoretical details, the professed adherents of Brown were neither numerous nor influential; and even in Italy, where for some time it enjoyed considerable popularity, it has long ceased to be maintained. Yet it must always occupy a distinguished place in the history of medical science, as exhibiting a remarkable example of the force of original and unaided genius in erecting a system, plausible and captivating in its aspect, but devoid of the essential support of facts and observations, and therefore fated to share the lot of all systems built on so unstable a basis.*

In connection with Brown I must notice a medical theorist, whose general principles bore a considerable resemblance to those of the "Elementa Medicinæ," but whose character, talents, and acquirements were of a totally opposite kind. The "Zoonomia" of Darwin exhibits genius and originality; but in no other respect does it bear any resemblance to its prototype. Darwin possessed a knowledge of medical and all the collateral sciences in their full extent; he was familiar with practice, and had a taste for minute detail and experimental research, which, while it appeared to qualify him for a medical theorist, enabled him to give to his system an imposing aspect of induction and generalization. His speculations, although highly refined, profess to be founded upon facts; and his arrangement and classification, although complicated, seem consistent in all their parts. No theory which had ever been offered to the public was more highly elaborated, and appeared to be more firmly supported by experience and observation, while every adventitious aid was given to it from the cultivated taste and extensive information of the writer. Yet the Zoonomia made little impression on public opinion; its leading doctrines rested rather upon metaphysical than upon physical considerations; its fundamental positions were found to be gratuitous, and many of the illustrations, although ingenious, were conceived to be inapplicable and inconclusive. It is now seldom referred to, except as a splendid monument of fruitless labour and misapplied learning.†

CHAPTER XII.

Remarks on the State of Practical Medicine at the Conclusion of the Eighteenth Century—State of Medicine in France, Lieutaud—State of Medicine in Germany, De Haën—State of Medicine in Italy, Morgagni, Burserius, Rasori—Epidemics—Improvements in Pharmacy.

While the British physicians were principally occupied in collecting facts and recording their observations, and, with the exception of the temporary suspension which was occasioned by the Brunonian controversy, were more intent in adding to the stock of knowledge than in forming systems, the continental physicians were more disposed to pursue the eclectic plan of Boerhaave. In France this was accomplished with the most success by Lieutaud. He was a native of Provence, and was for some years a professor at Aix; in 1749 he was appointed physician to the royal hospital at Versailles, and finally to the court of France. He was eminent both as a practitioner and an anatomist; his great work, the "Synopsis universæ Praxeos Medicæ," published in 1765, contains much information

* Beddoes's Observations, prefixed to his edition of Brown's Elements; a writer possessed of originality and genius, but perhaps not unaptly characterized by Rothe as "a blind adherent of the new chymists and of Brown." M'Kenzie, in Brewster's Enc., art. "Brown." Parr's Dict., art. "Brunonian System." Aikin's Gen. Biog. in loco. Sprengel, t. vi. p. 155–158, 315–334. Suard, Biographie Universelle, in loco.

† Brewster's Enc., in loco. Sprengel, vol. vi. p. 269, 70, 278, 9. Young's Med. Lit., p. 54, 5. Brown's Remarks on the Zoonomia, an acute, but rather severe critique. Suard, Biographie Universelle, in loco.

on all topics connected with medicine, and is valuable from its real merits in this respect, while it is interesting as affording a correct view of the state of medical science in France at that period. With respect to his general principles, he was an eclectic, uniting certain parts of the old doctrines of the mathematicians and the humoralists with those of Hoffmann and the vitalists.* Upon the whole, however, I conceive that I shall not be accused of partiality or want of candour in stating the opinion, that the views of Lieutaud and his countrymen are less matured than those of his contemporaries in this island or in Holland. I may remark, in speaking of France, that for many years the great seat of medical science in that country was Montpellier. Its university was established in the thirteenth century, and was one of the earliest of those which rose to any considerable eminence; a distinction which it maintained until it was rivalled by that of Paris, which gradually acquired its splendid reputation during the course of the seventeenth century. To the name of Sauvages, who was mentioned above as distinguished for his learned work on nosology, we may add those of Bordeu, Barthez, and Astruc as among the most eminent members of the school of Montpellier.†

Of the medical schools of Germany, the most celebrated during the seventeenth and eighteenth centuries was Vienna. I have already mentioned the exertions that were so successfully made for its advancement by Van Swieten, who was appointed one of its professors in the year 1734. After he had occupied this situation for about twenty years, he associated with himself his countryman De Haën, who materially contributed to support the reputation of the university, particularly by his talents as a practitioner. His great work, entitled, "Ratio Medendi," is a valuable repository of facts and observations, upon which I may make the same remark that I offered above respecting Lieutaud's "Synopsis." De Haën has been characterized as a man of great learning, united with much practical skill, and a talent for correct observation; but, on the other hand, he appears to have been unreasonably prejudiced against new opinions, and even improvements, in his art; for not only was he one of the most zealous opponents of Haller's theory, but he was no less decided in his opposition to the practice of inoculation, and to the use of various new remedies, which were at that period introduced into medicine, the value of which is now generally recognised. The state of medical theory then prevailing in Vienna was nearly the same with that which was taught in the universities of Leyden and Paris; the doctrines of the humoral pathology may be considered as forming the basis of their hypotheses; but upon these was engrafted a certain portion of the new views respecting the action of the nervous system and the contractibility of the muscular fibre.

In Italy, which so early acquired a high degree of celebrity for its medical schools, and which still retains a considerable portion of its former reputation, the sciences of anatomy and physiology were cultivated with success, while they were but little attended to in the other parts of Europe. What may be styled anatomical pathology took its rise in Italy in the seventeenth century. The individual to whom the merit of having opened this new road to the improvement of medical knowledge is principally due is Bonet,‡ who was born at Geneva in 1620, and at an advanced period of his life published his great work, entitled "Sepulchretum," which was afterward enlarged by his learned and industrious countryman Manget.§ The Sepulchretum has been styled "The Library of true Pathology;" it consists of a great collection of cases, in which we have a history of the disease, with the appearances found upon dissection. The plan which had been commenced by Bonet and Manget was followed up by Valsalva, an eminent professor of Bologna, and still further perfected by the illustrious Morgagni. This eminent anatomist was a pupil of Valsalva's, and afterward became professor in the university of Padua, where for nearly sixty years, until his death, which took place in 1771, he devoted himself without intermission to the study of his favourite pursuit. The principal works of Morgagni are, his "Adversaria Anatomica," his "Epistolæ Anatomicæ," and more especially his great pathological collection entitled "De Sedibus et Causis Morborum per Anatomiam indagatis." It proceeds

* Hutchinson's Biog. Med., vol. ii. p. 63 et seq.

† Moreau de la Sarthe, Encyc. Méth. Médecine, in loco.

‡ Haller, Bibl. Med. lib. 10, §. 750, t. iii. p. 236 et seq. Eloy, in loco. Dezeimeris, Arch. Gén. de Méd. xx. 156, 9.

§ Haller, Bibl. Anat. lib. 7, §. 749, t. i. p. 103 et seq. Haller, Bibl. Med. lib. 11, §. 889, t. iii. p. 603 et seq. Eloy, in loco.

upon the plan of Bonet's Sepulchretum, and contains the observations which were made both by himself and by Valsalva, and has always been regarded as a repository of facts and observations on anatomy and pathology, unequalled in extent and accuracy.*

The Institutions of Burserius afford a favourable view of the state of medical science in Italy at this period. He was born at Trent in 1724; studied first at Padua, and afterward at Bologna; he was for some years a professor in the university of Pavia, and finally removed to Milan, where he died in 1785.† Burserius was rather an eclectic than an original theorist, but his work is much valued for the information which it contains, and much admired for the elegant manner in which the information is conveyed. Like his contemporaries in Holland, France, and Germany, his doctrines are essentially founded upon those of the humoralists, but to these he unites various parts of those of the solidists and vitalists, and has proved himself deserving of the praise, not only of learning, but of candour and judgment.

I have already had occasion to remark upon the effect which was produced in Italy by the theory of Brown; it was embraced by many of the learned men of that country, and for some time acquired a considerably greater ascendency over public opinion than it possessed even in its native city. It was not only defended in their publications, but its doctrines were applied to practice, and it was not until their insufficiency had been detected by fatal experience that the delusion was removed.‡ At the conclusion of the eighteenth century it would seem that the medical theories of the Italians were considerably similar to those of the Cullenean school, and that the Italians, like the English physicians, were little disposed to form systems of medicine, but devoted themselves principally to the cultivation of anatomy and physiology, in addition to the more immediate studies of their profession.

In tracing the additions and improvements which the science of medicine received during the eighteenth century, I must not omit to notice the descriptions of new diseases, either those which were conceived to have actually originated during this period, if there were any such, or those which had not been previously discriminated with sufficient accuracy from others that in many respects resembled them. The various epidemics which, from some unascertained and unexplained causes, have at different times passed over large portions of the surface of the earth; the endemic diseases attached to particular situations, originating in some circumstances connected with the atmosphere, soil, or climate of certain districts, or in the occupation or mode of life of its inhabitants; and lastly, the contagious or infectious diseases, which have invaded entire cities or communities, from unknown, or at least obscure causes, and, after spreading destruction on all sides, have disappeared from causes equally unascertained.

The first of these classes, the epidemic diseases, were made an especial object of attention, in the latter part of the seventeenth century, by Sydenham, whose remarks on them are among the most interesting of his works; also by Morton and by Ramazzini: at a somewhat later period we have the valuable observations of Huxham, of Lancisi and Torti in Italy, and of Stoll at Vienna. The science has been much enriched by various descriptions of the diseases incident to the army and navy, among which we may particularly notice those of Pringle, Brocklesby, D. Monro, Hunter, Lind, Hillary, Blane, Trotter, Larrey, and Desgenettes.§ The formidable disease which has been emphatically termed the Plague, as it appeared in London, the Low Countries, Marseilles, Moscow, and other parts of Europe, in the latter part of the seventeenth and the beginning of the eighteenth century, and as it still exists in Turkey, Egypt, and the adjoining countries,‖ as well

* Eloy, in loco. Haller, Bibl. Anat. lib. 8, §. 797, t. ii. p. 34 et seq. Haller, Bibl. Med. lib. 12, §. 1029, t. iv. p. 424 et seq. Renauldin, Biog. Univ. in loco.

† Vide Præf. ad Instit. Med. Prac. ed. Lips. 1787.

‡ Rasori of Genoa appears to have been the first who made his countrymen acquainted with the doctrines of Brown, of which he was a zealous adherent; subsequently, however, he found reason, from the result of experience, to change his opinions, and very candidly and honestly expressed his conviction of their erroneous tendency. An ample account of the pathological doctrines which are at present the most generally received in Italy, under the title of "Nuova Dottrina Italiana," may be found in the various publications of Tommasini, the learned professor of Bologna.

§ For a very complete list of works on these subjects, the reader is referred to the valuable work of Professor Ballingall on Military Surgery, p. 227 et seq.

‖ Hecker's account of the "Black Death," which ravaged so large a portion of the globe in the

as the less formidable, although more extensive visitations of the influenza, have each had their historians; and it is truly gratifying to observe that, in most cases, the writers have been more anxious to collect facts and to obtain correct information, than to support any particular theoretical views.*

In reviewing the state of medical science during the eighteenth century, and tracing its gradual advancement, we are naturally led to remark upon the great additions which have been made to pharmacy, both in regard to the introduction of new articles into the materia medica, and the improvement that has taken place in the preparation of various substances, and the mode of their administration. It has been remarked, that in proportion as our knowledge of the virtues and qualities of medicines has been matured, our pharmacopœia has been simplified, both as to the number of articles employed and the mode of compounding them. Accordingly, if we compare the successive editions of the British pharmacopœias and dispensatories, we shall find that a number of superfluous and inert substances have been from time to time rejected, and that the complex formulæ of the older physicians have been reduced in the same proportion. At the same time some substances of real efficiency have been added, while the improvement in chymical science has enabled us to obtain the active principles of these substances in much more condensed and commodious forms. This remark may be illustrated by Peruvian bark, a remedy which for a long period afforded a fertile field for controversy, both as to its power over disease, the nature of its operation, and the mode of its administration. Practitioners have long been aware of the futility of most of the points which were the subject of so much warm and even acrimonious discussion, and are satisfied with recognising its value as a powerful curative agent in certain diseases, without endeavouring to discover the nature of the occult qualities on which its operation depends; while the chymist has lent his aid in pointing out a mode by which its active proximate principle may be procured, detached from the inert matter with which it is naturally combined. The skill of the modern chymist has likewise been most beneficially exercised on the metallic preparations; giving them more fixed and definite combinations, pointing out the modes by which they may be produced with more ease and certainty, and ascertaining the chymical relation which they bear to other substances, so as to indicate how they may be combined with them without decomposition, or even with an increase of their activity.

CHAPTER XIII.

Cursory Remarks on the State of Practical Medicine since the Commencement of the present Century—Difficulty of acquiring Medical Experience—State of Medicine in Great Britain—Pathologists of France—Physiologists of Germany—Medical Journals—Medical Societies—Schools of Medicine—Suggestions for the Improvement of Medical Science.

As the historian of medicine approaches nearer to his own times, he finds his path encumbered with almost insurmountable difficulties. The subject on which he has to treat differs, perhaps, from every other branch of science in this circumstance, that our actual information does not increase, in any degree, in proportion to our experience. Hence it follows that the accumulation of materials frequently rather retards than promotes its progress. In other sciences, although truth is not to be attained without a certain degree of laborious research, yet to those who are willing to bestow on it the requisite attention, it is, for the most part, attain-

fourteenth century, may be mentioned as a work worthy of our notice, both as containing many interesting details of this tremendous pestilence, and as exhibiting a curious specimen of medical hypothesis.

* For the names of the authors who have treated on these topics, I must refer to the respective articles in the Cyclopedia of Medicine. Copious lists of authors may also be found in Young's Medical Literature, a work no less remarkable for its learning than for the condensed form in which it is communicated. Much valuable information on this subject will be found in Sprengel, sect 16. ch. 3. art. 2.

able, or, if it still eludes our grasp, we are at least sensible of the deficiency, and can generally ascertain the precise nature of the obstacles which impede our progress. In other sciences, when we enter upon an inquiry, or propose to ourselves any definite object for experiment or observation, we are able to say whether the result of our inquiry has been satisfactory, and whether the object in view has or has not been accomplished.

But this is unfortunately not the case in medicine. There are certain peculiarities necessarily connected with the subject, which render it extremely difficult to appreciate the value of experiment and observation. In our experiments we are seldom able to ascertain with accuracy the previous state of the body on which we operate, and in our observations we are seldom able to ascertain what is the exact cause of the effect which we witness. The history of medicine in all its parts, and especially that of the materia medica, affords ample testimony to the truth of these remarks. In modern times, and more remarkably in Great Britain, no one thinks of proposing a new mode of practice without supporting it by the results of practical experience. The disease exists, the remedy is prescribed, and the disease is removed; we have no reason to doubt the veracity or the ability of the narrator; his favourable report induces his contemporaries to pursue the same means of cure, the same favourable result is obtained, and it appears impossible for any fact to be supported by more decisive testimony. Yet in the space of a few short years the boasted remedy has lost its virtue, the disease no longer yields to its power, while its place is supplied by some new remedy, which, like its predecessors, runs through the same career of expectation, success, and disappointment.

Let us apply these remarks to the case of fever, the disease which has been styled the touchstone of medical theory, and which may be pronounced to be its opprobrium. At the termination of the last century, while the doctrine of Cullen was generally embraced, typhus fever was called a disease of debility, and was of course to be cured by tonics and stimulants. No sooner was it ascertained to exist, than bark and wine were administered in as large doses as the patient could be induced, or was found able to take. No doubt was entertained of their power over the disease; the only question that caused any doubt in the mind of the practitioner was, whether the patient could bear the quantity that would be necessary for the cure.

To this treatment succeeded that of cold affusion. The high character and literary reputation of the individual who proposed this remedy, its simplicity and easy application, the candid spirit which was manifested, and the strong testimonials which were adduced by his contemporaries, bore down all opposition, and we flattered ourselves that we had at length subdued the formidable monster. But we were doomed to experience the ordinary process of disappointment; the practice, as usual, was found inefficient or injurious, and it was, after a short time, supplanted by the use of the lancet. But this practice was even more short-lived than either of its predecessors; and thus, in a space of less than forty years, we have gone through three revolutions of opinion with respect to our treatment of a disease of very frequent occurrence, and of the most decisive and urgent symptoms.

Are we, then, to conclude that all medical treatment is of no avail? that it is all imaginary or deceptive? I should feel most unwilling to be compelled to form such a conclusion, nor do I conceive that it necessarily follows from the premises; but the facts certainly prove the importance of extreme caution in forming our conclusions, and still more that mere experience, without the due combination of well regulated theory, is a most fallacious guide. What objection can the man of mere experience, the rejector of all theoretical deductions, urge against the multiplied testimony that is now presented to us in favour of the Homoiopathic doctrine?—what answer can be made to the report that has been recently brought forward, by the medical commissioners of Paris, on the subject of Animal Magnetism? The conclusion that forces itself irresistibly on the mind is, that no medical testimony is sufficient to establish a fact which is in itself incredible, and that this previous incredibility can only be ascertained by an extensive and accurate knowledge of the functions and properties of the living body, both mental and corporal, in all its modifications and under all circumstances, and by a correct and careful generalization of the knowledge thus obtained. These considerations, as

well as others which will present themselves to the mind of the reader, may be deemed a sufficient reason for my attempting no more than to offer a few general observations on the state of medical science during the period at which I am now arrived. I shall therefore devote this chapter to some cursory remarks on the practice of medicine as it now exists in the different countries of Europe, as well as on the state of some of the collateral or auxiliary departments, and shall conclude by some suggestions for the best means for promoting its future progress.

The prevailing and predominant feeling of the most enlightened and the most judicious of the British practitioners during the period referred to, has been to place little value upon theory, and to devote their minds almost exclusively to the observation and collection of facts. There can be no doubt that this is a less injurious extreme than the opposite; but if the statement which has been made above be correct, it will probably be admitted that this system may be carried too far. And the same exclusiveness has also induced them to pay too little attention to some of the collateral departments of science. In pathology and in pharmaceutical chymistry they have been far outstripped by the French, and in physiology by the Germans. But at the same time that I feel it necessary to pass this judgment on my countrymen, I must fully admit that the spirit of rational empiricism, to which I have referred above as the characteristic feature of the Cullenean school, has produced a most beneficial influence on the general state of medical practice. If it has, on some occasions, produced fluctuation of opinion, and in others indecision or inertness, it has tended to sweep away much error, and to purify the science from many of the antiquated doctrines and practices that still maintain their ground among our continental brethren. This is more especially the case with our pharmacopœias, where, if we compare those of London and Paris, we shall be struck with the number of what we conceive to be useless articles that are still retained in the latter, sanctioned by the authority of the scientific and enlightened body of men who compose the medical faculty of the French metropolis. We are, however, indebted to France for the most important improvements which have taken place in pharmaceutical chymistry: by their method of obtaining the proximate principles of various vegetable substances, and the greater precision which they have introduced into the formation of the metallic preparations, they have conferred a great and lasting benefit on the art, which, among all the revolutions of opinions and practices, can never be countervailed.*

But the glory of French medical science is its pathology. We are justly proud of our Hunters, our Munros, and our Baillie; and there are certain individuals among our contemporaries who are emulously treading in their footsteps. But any feeling of national vanity which we might be disposed to indulge must be effectually repressed when we look at the illustrious band of French pathologists, when we review the labours of Pinel, Andral, Breschet, Broussais, Corvisart, Cruveilhier, Dupuytren, Laennec, Bayle, Louis, Gendrin, Foville, Chaussier, and others,† who have directed their attention more exclusively to pathology; and when we add to these the names of those who are to be regarded more in the light of physiologists, Bichat, Vic-d'Azyr, Cuvier, Richerand, Majendie, Edwards, Dumas, Legallois, Adelon, Demoulins, Serres, Blainville, Flourens, St. Hilaire, Dutrochet, and others, we must admit that France exhibits an unrivalled assemblage of medical philosophers. From the united labours of these eminent men it is impossible not to anticipate the most important results; but I believe that I am justified in asserting that, so far as the practice of medicine is concerned, the benefit is still rather in anticipation than in existence. With certain exceptions, but these no doubt very important ones, I should characterize the French practice as decidedly less effective than that of our country; dependence is placed on remedies which we

* We have a very learned review of the state of medicine during the early part of the present century from the pen of the celebrated Sprengel. It is peculiarly valuable, from the numerous references which it contains to the writers of Germany, and from the view that it presents of the opinions which prevail in that country. The German physiologists afford a singular admixture of profound investigation and fanciful mysticism.—Ed. Med. Journ. v. xii. p. 385 et seq. We have also an interesting sketch of the progress of the science by Cuvier; Hist. Scien. Nat. t. i. p. 311-344, and t. iv. p. 2303-44.

† I may refer my readers for an interesting account of the progress of pathology, since the commencement of the present century, to a series of papers in the Archives Générales de Médecine, by M. Dezeimeris, t. xxix. et seq. The "Dissertation" of Professor Alison, appended to the "Cyclopædia of Practical Medicine," contains an admirable view of the state of medical science generally during this period.

conceive to be inert, and much of the dietetic regimen which enters so largely into the treatment can produce no effect in the removal of disease. In short, their "médecine expectante," although it may be a less dangerous weapon in the hands of ignorance or presumption, is, in the same proportion, less powerful and beneficial when under the direction of skill and judgment.

If France is pre-eminent for its pathology, Germany is no less so for its physiology and its anatomy. The names of Camper, Blumenbach, Ludwig, Soëmmering, Meckel, Wrisberg, Reil, Tiedemann, Wenzel, Sprengel, Jacobsen, Carus, Pfaff, Oken, Osiander, Ackermann, Rosenmüller, Gmelin, Walter, and Treviranus may be selected from many others, as among the most celebrated throughout Europe, and as having made most important additions to our knowledge on the subjects to which they have particularly directed their attention. Yet, in Germany as in France, the effect of this scientific co-operation on the practice of medicine is not yet fully experienced. The treatment of disease is perhaps not more effective than in France, while it is still more encumbered with complicated formulæ and with antiquated practices, which in this country have been discarded because they have been found useless or even injurious.* Italy, which so long took the lead in all scientific pursuits, now offers the aspect of a splendid ruin, where we occasionally meet with an illustrious name, such for example as those of Scarpa, Caldani, Mascagni, Rolando, Bellingeri, and Tommasini, but where medical science, if it has not retrograded, has at least remained stationary. The practice of medicine has, however, had some zealous cultivators; I have already remarked on the activity with which the Brunonian controversy was pursued, and the excitement which was then produced seems to have had a beneficial effect in rousing the dormant energy of the mind, of which some traces are still visible.

A circumstance which has materially contributed to the improvement of the knowledge of practical medicine is the publication of periodical works, whether in the form of journals or of the transactions of societies. They have brought before the public the daily occurrences and passing events in a commodious and interesting form, and thus by exciting attention to them, have tended both to diffuse and to increase our knowledge on these subjects. It is, however, very much to be regretted that so valuable a mode of communication should, in too many instances, be used as the medium of personal animosity, and that what ought to be employed for the promotion of the welfare of mankind should become a vehicle of the basest and the most malignant passions. On this point, as well as on the one referred to above, justice compels me to state that the French metropolis offers us an example by which we might profit, in the number, extent, and general character of its medical periodicals; and the same sentiment leads me to remark, that the medical periodicals of London are decidedly excelled by those of Edinburgh and Dublin.—Among the published transactions of medical societies, the Medico-Chirurgical may fairly be selected for our approbation; these, in the short space of about twenty-four years, have amounted to eighteen volumes, and have acquired a character which is too well established to require recommendation or sanction.

In connection with their transactions I may mention the effect of the societies themselves, which, when they are confined to subjects of medical science, must be highly beneficial. Perhaps no single institution has contributed more to the improvement of our profession than the Edinburgh Medical Society, which, for so long a period, has maintained a reputation that reflects the greatest credit, not merely on its members, but even on the university to which it is attached. It is, indeed, a remarkable and an honourable circumstance, that an association, principally composed of students and entirely conducted by them, should have proceeded for above half a century in so uniform a course of respectability; that during this period they should have admitted of free discussion, without deviating into licentiousness, and that amid the fluctuations to which such an association must necessarily be subject, successors have at all times been found able to direct its progress and qualified to support its reputation.

Another circumstance to which I must briefly advert, which is both the cause and the consequence of the progress of our art, is the improved state of medical schools of all descriptions, both those attached to universities or to public hospitals,

* In speaking of the practical writers of Germany, it would be unjust to omit the name of Frank, and not to acknowledge the obligation which he has conferred upon medical science. Among the pathologists, Hartmann of Vienna and Conradi of Gottingen are perhaps the best known in this country.

and those conducted by private individuals. By a very singular anomaly it has happened that, in this country, the highest medical honours have been hitherto conferred by those bodies who did not profess to give the requisite means for their attainment. This circumstance may, indeed, in one point of view be regarded as paying the highest compliment to the English universities; but I believe that a very general sentiment now prevails among their most respectable members that this anomaly ought no longer to be suffered to exist, and that medical honours ought to be bestowed upon those, and those only, who have gone through what may be considered a sufficient course of preparatory studies, and who are able to give satisfactory proof that they have taken the due advantage of the means of improvement presented to them. But whatever may have been wanting in the English universities has been long supplied by that of Edinburgh, and, at a later period, by those of Glasgow and Dublin. The great London hospitals, and some of the private schools, especially those of anatomy, have, for a number of years, possessed teachers of the highest talents, and most admirably qualified for their office; but our metropolis could not be said to hold out the means of a complete medical education previous to the establishment of the London University and the King's College. These rival schools, rivals as I trust they will always be only in the talents of their professors and the excellence of their arrangements, have each of them laid down an academical course of medical instruction, which appears to be complete in all its parts, and which must have the most salutary influence on the character and qualifications of the future members of the profession.

The perusal of the foregoing pages may, I hope, enable my readers to form a tolerably accurate conception of the progress of practical medicine, of the obstacles which it has had to encounter, of the degree in which it has overcome these obstacles, and of its present state of improvement. This I am not disposed to underrate; but at the same time I must acknowledge, that when I reflect upon the immense mass which has been written on the subject, the result seems scarcely adequate to the labour that has been bestowed. I may, therefore, be pardoned if I offer a very few remarks on the means by which, as it appears to me, the object in view might be more effectually attained.

This, I conceive, should be attempted precisely upon the same plan as in other departments of science;—in the first place, by a more careful exposition of facts; and, secondly, by a more careful generalization of them. In medicine there are various circumstances which render it less easy to ascertain the facts than in most other cases. These depend partly on the nature of the subject, and partly on the situation and character of the observer. It was the shrewd remark of a learned professor that in medicine there are more false facts than false opinions. On all topics, either historical, scientific, or literary, mankind possess a strong avidity for the marvellous. From the constitution of the human mind, the love of novelty is one great principle by which the attention is excited and the intellectual powers are called into action. Hence, in a rude state of society, nearly the whole art of medicine consists in the dexterous employment of this agent, and hence it is still found the most effectual method of attracting the notice of the multitude, who are incapable of close reasoning or calm investigation.

Perhaps one of the most easy and at the same time the most effective means of counteracting this mischievous influence, would be never to receive the evidence for any medical facts upon the authority of a single individual. They should, if possible, emanate from associated bodies, either from public hospitals, medical schools, or societies, the officers of which may afford their united testimony to the alleged facts. Another point which appears to me of vital importance, and which bears essentially upon every department of medicine, is that nothing should be received without the name of the author. The custom of anonymous writing, which has of late increased to so great an extent, has produced the most unhappy effects, both on the state of medical science and on the character of its professors; it has given rise to a degraded and depraved taste, no less at variance with honour and honesty, than with the spirit of scientific research. I will venture to assert that no man ought to publish any statement or any opinion to which he would scruple to attach his name. It may occasionally happen that an individual of a timid or a modest disposition may, by this restriction, be deterred from detecting an error or controverting a train of false reasoning, but the loss which might by these means be incurred would be amply repaid by the greater authenticity and the greater correctness of our medical publications.

With respect to the second suggestion, the more accurate generalization of facts, when the facts themselves are fully substantiated,—this must be accomplished by the due exercise of judgment and sagacity, and can scarcely be directed by any general rules. I may remark, however, that one obvious mode of attaining this end is to arrange our insulated facts, as much as possible, in the form of statistical tables, by which we may readily observe their connection with or relation to each other, and may thus be prevented from forming a hasty or unauthorized conclusion, derived merely from single cases or individual observations.

Another important means of obtaining the object in view is to preserve great precision in the use of technical and scientific terms. How many controversies have occupied the mind for ages, and have filled almost innumerable volumes, which have essentially turned upon the definition of a word? How frequently have remedies been prescribed, not for the symptoms, but for the name of a disease? How frequently has an article of the materia medica been employed, not from an experience of its actual effects, but from some nominal property assigned to it by an imperfect analogy or imaginary quality? The means that have been proposed to check these aberrations, to rectify the above-mentioned errors, and to reduce medical science to its appropriate and correct limits, are indeed few and simple, and not of difficult application. But there is one essential requisite, without which they can be of no avail,—a mind disposed to the reception of truth, determined to follow it wherever it may lead the inquirer, united to a high sense of moral obligation, which may induce the medical practitioner to bear in mind that his profession is a deposite placed in his hands for the benefit of mankind, and that he incurs an awful degree of moral responsibility who abuses this sacred trust, or diverts it to a base or selfish purpose.

THE

STUDY OF MEDICINE.

TO

SIR HENRY HALFORD, BART.

M.D. F.R.S. F.A.S.

PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON, PHYSICIAN TO THE KING,

THIS WORK

IS

INSCRIBED

AS

A TRIBUTE OF GRATITUDE AND FRIENDSHIP.

AUGUST VI, MDCCCXXII.

EDITOR'S PREFACE

TO

THE FOURTH ENGLISH EDITION.

When the learned and very distinguished author of the "Study of Medicine," much to the regret of every lover of talent and worth, went to that bourn from which no traveller returns, he had already advanced a considerable way in preparations for a new edition of this his favourite production; one to which he had devoted a great portion of the latter part of his life. At the period of his death, he had revised all the five volumes, which the work then consisted of, and he had introduced into each of them numerous additional observations, tending to augment their utility and correctness. Various parts of the work, however, still demanded further attention, and none more so than its surgical articles. It was under these circumstances that I was requested by his family to make some arrangement with the booksellers, by which the third edition might be completed and published; and finding that Messrs. Underwood were ready to offer a fair consideration for the copy-right, if I would give my assistance as editor, terms were agreed upon, and the undertaking was finished towards the close of 1829. After the failure of Messrs. Underwood, the copy-right became the property of Messrs. Longman and Co.; and the third edition having been entirely disposed of, a fourth has been called for, on which much time and labour have been expended. Subsequently to the date of the last edition, as it is scarcely necessary to explain, various important contributions have been made to medical science, bearing very materially upon some of the doctrines inculcated in the "Study of Medicine," sometimes corroborating, and, in other instances, as must be confessed, invalidating, or even refuting them.

These stores of new and modern information, comprised in the writings of some of the most distinguished physiologists, pathologists, and medical practitioners of the present time, have been extensively resorted to for the correction and improvement of this system of physic. Whether I have exceeded the editorial functions, or whether too little or too much has been done, it is not for me, but the profession, to determine. One apprehension has constantly followed me in the task, namely, that of stepping over the bounds, within which every discreet editor ought to confine himself. On this account, I have not presumed to encroach upon the author's plan, which, whatever may be the defects in its execution, rests upon a solid foundation, and has the pleasing recommendation of originality. But although, with few exceptions, the arrangement of the subjects treated of has not been changed, I have sometimes ventured to express reasons for thinking some of them misplaced. With the same frankness, I have also stated the

considerations which have now and then inclined me not to adopt precisely the views entertained by the author on certain points in physiology, pathology, and the treatment of diseases. So far as my own knowledge extends, no celebrated writers on medicine have yet been able completely to avoid hypothesis; and, if the present author has occasionally soared into the regions of conjecture, he has only imitated all the greatest of his predecessors. For such flights every man, conscious of the difficulties of medical science, and aware of the zeal, perseverance, and active mind of the late Dr. Good, will readily find an excuse. If the general tenour of the book is good; if many parts of it are executed in a truly superior style (their matter being daily referred to as high authority on the subjects to which they relate, and this by authors and lecturers of acknowledged judgment), surely the imperfections of so difficult an undertaking will be indulgently disregarded by every liberal critic, and its genuine merit warmly admired. As a system of physic, adorned with learned research, it is, perhaps, unrivalled.

In this fourth edition, a great deal of new and interesting matter has been inserted, principally in the form of notes, in order to avoid taking too much liberty with the text, or mutilating the work in a degree that seemed to me unwarrantable. I may also observe, with respect to incorporations in the text, that they are marked in such a manner, that the reader will immediately perceive the passages for which my own character, and not that of Dr. Good, is responsible.

In the fourth volume will be found the particulars of an extraordinary case, under Mr. Thomas Law, of Penrith, in which innumerable portions of tænia have been voided, and still continue to be so, from the meatus urinarius; the only instance, I believe, of such an occurrence on record. Some of the specimens I mean to transmit to the Museum of the Royal College of Surgeons, and others to that of the University of London.

S. COOPER.

7 Woburn Place, Russell Square,
Nov. 1st, 1834.

PREFACE

TO

THE FIRST EDITION.

The object of the present work is to unite the different branches of medical science, which, when carried to any considerable extent, have hitherto, by most writers, been treated of separately, into a general system, so that the whole may be contemplated under a single view, and pursued under a common study. These branches are the following:—

I. Physiology, or the doctrine of the natural action of the living principle.
II. Pathology, or the doctrine of its morbid action.
III. Nosology, or the doctrine of the classification of diseases.
IV. Therapeutics, or the doctrine of their treatment and cure.

All these are of high, if not of equal, importance. As it is impossible for a workman to set about restoring a machine to order, with any rational hope of success, without knowing the full extent and nature of the injury it has sustained, so is it, equally impossible for him to acquire this knowledge, unless he has also a knowledge of the structure of the machine, and has studied its several parts methodically, and in reference to the bearing which one part has upon another.

It is this advantage of the study of one part in relation to another that constitutes, or should constitute, in the art of medicine, the basis of nosological arrangement; for by grouping diseases, not arbitrarily, but in the order of connexion in which they make their appearance in different functions, and the organs on which those functions depend, it is almost impossible to obtain an insight into the nature of any one disease belonging to such groups, without obtaining some insight into the nature of the rest, or tracing out some of the laws of morbid action which are common to the whole.

If it be convenient to concentrate the diseases of the nervous department into one division, as has been attempted by many nosologists, and ably accomplished by Dr. Cullen, it is to be lamented that the same principle has not been allowed to pervade the whole of the nosological plan; and that the diseases of the other chief departments of the animal frame have not been concentrated in the same way, instead of being scattered, as we too often find them, over different divisions of a classification that is itself perpetually shifting from one ground of arrangement to another: which in one division, as in the Synopsis of Dr. Cullen, by far the best of his day, is derived from the temperature of the body; in a second, from its anatomical structure; in a third, from its chymical depravities; and in a fourth, from its topography: thus offering us in each division a new principle, and one that has no common clew, or analogy with the rest.

It was the hope of obtaining a clearer and more connected method than had

hitherto been studied in the schools of medicine, that induced the present author to turn his attention to this subject many years ago, and at length enabled him to submit to the public a System of Nosology founded entirely on a physiological basis, in which the diseases of the respective functions of the animal frame are connected in classes derived from those functions, and follow each other in the order in which physiologists have usually treated of them.

It was not, however, from a mere hope of obtaining a more exact and comprehensive synopsis of diseases that the author was induced to undertake this new arrangement, but with a view of employing it as a text-book for the collateral branches of the Art of Healing already adverted to, as soon as he should find leisure to enter upon them, and to which no other synopsis he was acquainted with seemed equally adapted.

This work was published in the beginning of 1817, under the title of a "Physiological System of Nosology, with a corrected and simplified Nomenclature;" and the favourable opinion which has been formed of it; its adoption as a text-book in various medical schools of high reputation in our own country, and on the continent; the application which has been made to the author by some of the oldest and most established lecturers of this metropolis to print a syllabus of its classification for the purpose of lecturing from; and, above all, the approbation which the Royal College of Physicians has bestowed upon it, by permitting it to be dedicated to that learned body, after having been circulated amidst the fellows of the college, under an express order of the late president, for an examination of its contents by every individual at his own house, are, he trusts, a sufficient apology for his adhering to his original intention, and taking this system, instead of any other, as the groundwork of the ensuing arrangement.

It is not necessary in the present place to enter into a minute explanation of the subordinate parts of this system, nor of the occasional changes in medical nomenclature which are to be found in it; and which a close attention to correctness and simplicity seemed to render indispensable. All these are fully illustrated in the Preliminary Dissertation to the volume of Nosology, which the author is desirous of having regarded as a part of the general design. An alteration in the distribution of one or two of the diseases, as originally laid down, may be noticed by an attentive eye in the present volumes. They are changes which have been made out of deference to the opinions of others, or from a maturer consideration of the subject by the author himself: but, upon the whole, they are too few and of too little importance to render it necessary to indicate them in the present place.

A pretty active spirit of PHYSIOLOGY will be found to pervade the entire work; but the author has, beyond this, availed himself of the advantage which his arrangement so readily allows, of prefixing to every class a summary of the most important laws and interesting discoveries of physiology that relate to, or can elucidate, the subjects which constitute its scope. And he has occasionally enriched the dissertation by a glance at the more striking analogies of the animal and even of the vegetable world at large, wherever they could add to the illustration.

In the PATHOLOGICAL DEPARTMENT, if the reader meet with an occasional development of new principles, a question as to several that have been long before the public, or a further extension of many that are well established, the author trusts that whatever doctrines are advanced will, at least, be found true to themselves, and form a digested system, operating in accordance through the entire work, in what way soever they may be affected by future investigations. He trusts it will also be found, that nothing is newly started for the mere sake of novelty, or controverted from a mere love of disputation; and that, whenever it has been his misfortune to differ from high authorities which have preceded him, he has done it

with the candour which should peculiarly characterize a liberal profession. His main object has been to explain to the student the different subjects that pass before him, and to illustrate them by analogies, instead of confining himself to a dry and wearisome history of morbid symptoms and operations.

In THERAPEUTICS the author has allowed himself a liberal range, and has, occasionally, introduced into his Materia Medica, substances that are highly esteemed abroad, though little valued or even known at home, or that seem, without reason, to have fallen into temporary disrepute. There are some practitioners who think that all the articles which are of real use in the cure of diseases lie within a small compass, and may be learned without burdening the memory. This remark may be allowed to those who are limited to a portable dispensary, as in travelling, or on shipboard; but when uttered under other circumstances, it savours less of wisdom than of indolence. If the pharmacopœias of former times were too voluminous, and were occasionally loaded with medicines of trifling importance, the lopping and topping that must hereupon ensue would make a destructive inroad upon their boundaries, and take from them much that is good as well as something that can be spared. We may easily, indeed, substitute one medicine for another, but it is very rarely that we can hereby obtain an integral representative; a remedy possessing not only the general but the particular qualities of that whose place is supplied, so as to be equally adapted to the exact state of the disease or the express character of the idiosyncrasy. Sir George Baker was engaged as reasonably and scientifically in examining into the virtues of the cardamine pratensis, or lady's smock, as Dr. Stoerck in proving, upon his own person, the violent powers of colchicum and stramonium. A common fate has, indeed, attended the whole of these experiments. From attracting and concentrating the attention of the public, the medicines to which they were directed became equally overvalued; were employed upon all occasions; produced frequent disappointment; and gradually fell into disuse. The colchicum has been fortunate enough to ascend once more to its full zenith of popularity; many efforts have been made on behalf of the stramonium; and the cardamine, though at present less successful than either of the others, still holds in abeyance its post in the established pharmacopœias, waiting for some lucky trial to bring it once more into general esteem.

A work erected upon scientific principles, should know nothing of these accidental reverses, and still less of the varying and too often capricious taste of the day. To judge by the sentiments of some writers, the reputation of the bark seems at present on the wane, while the seeds of the croton tiglium, after a long neglect, are again rising into notice. In the remedial part of the present work, the author has endeavoured to allow to every medicine its proper value, as far as he has been able to estimate it, whatever may have been the era of its credit; and as there can be no stronger ground for the study of botany, oryctology, or chymistry, than the advantage they afford to the art of healing, and as these are provinces cultivated in our own day by almost every one, he has felt himself called upon by the general voice of the times to range with some latitude over the medicinal stores afforded by art and nature, and to discriminate the respective properties of each, rather than to limit himself to a few leading productions, or to refer to the whole under the general divisions of stimulants, sedatives, and cathartics, or whatever other names may serve for a medicinal classification.

It is this, indeed, that after all must chiefly constitute the THERAPIA, or PRACTICE OF MEDICINE, to which every thing else, though of the utmost moment, is but introductory. "The First Lines" of Dr. Cullen, when read, as they were delivered, in connexion with his "Treatise on the Materia Medica," constitute the most important course of instruction that has ever, perhaps, been laid down and con-

pleted by the same individual. But for this purpose they must be read together, though they were not published together, nor for the express design of forming a contemporaneous study: for it is a singular fact, that the First Lines of the Practice of Physic, though full both of mind and of matter, of elaborate axioms and theoretical principles, contain little of what the title suggests; while the Treatise on the Materia Medica, without making any pretensions to the subject, is altogether a practical work, replete with practical principles, and founded upon a practical investigation.

Whatever may be the theory or the practice advanced in the ensuing volumes, the author will generally be found to leave nothing upon trust; but to support or illustrate his assertions by authorities which he has endeavoured to give, with some degree of copiousness, from ancient as well as modern times: so as to render the work in a certain sense a summary of the general history of medicine in most ages and countries.

To the labours of our own countrymen, however, he professes to be chiefly indebted for his supplies: to the illustrious dead and to the illustrious living: to all of whom he has conscientiously endeavoured to do justice, even where he has been under the misfortune of differing from any of them in opinion. With the former he can have no controversy; and, with the latter, he has taken the most gratifying means of avoiding it, and at the same time of adding considerably to the value of his work, by submitting to the most distinguished of them, and especially to those with whom he has the honour of a personal acquaintance, the successive sheets of the work, while passing through the press, that contain a notice of their respective opinions or publications; with a request that they would correct any incidental misstatement, or communicate any valuable hint that may since have occurred to them on the subject. It would occupy too much space to enumerate all the individuals to whom the author has been indebted for assistance of this kind: but there are several whose names the public ought to be made acquainted with, as adding, in no ordinary degree, to the authority of the work itself.

He has, in the first place, to return his very grateful thanks to the President of the Royal College of Physicians, without whose fostering encouragement his health and strength, considerably encroached upon by the laborious and unremitting study with which it has been necessary to prosecute the subject, would hardly have held out to its close; and who has not only taken the trouble of examining the sheets that relate to his own valuable labours, but of watching the progress of the work generally, and of perusing many parts of it as they have issued from the press. He has next to offer his acknowledgments to his highly distinguished and venerable friend, Dr. Perceval, of Dublin; who has been so kind as to favour him with a valuable manuscript series of notes, in the form of a running commentary, upon the entire volume of Nosology, in illustration of its definitions or opinions; the whole of which will be found imbodied into the present work, with a reference to the real author in every instance. To the liberality of Sir James M'Grigor he is indebted for important assistance on several occasions, and particularly for his munificent offer of a free and facilitated access to all the medical documents of the army, addressed to him as Director-General. To his kind friend, Sir John Webb, he is also largely indebted for similar assistance from the Ordnance Department, and particularly in respect to the subject of plague, upon which he has proved himself to be so perfectly conversant. The kindness of Dr. Baillie can never be erased from the author's memory; but he has particularly to thank him on the present occasion for reviewing the article on spasmodic stricture of the rectum, as well as several others, which, without his previous labours, would not perhaps have been found in the present work, or have been found but very imperfectly.

To Dr. Latham he is under obligations on various accounts; but, in the present work, he is especially indebted to him for his friendly revision of the article *paruria mellita*, or *diabetes*. The volumes will display abundant instances in which he has derived assistance from the comprehensive mind of Sir Gilbert Blane, but the friendliness with which he has consented to furnish him with a description of his own case, in a very singular and obstinate attack of prurigo, and to revise the statement when printed, demands an especial acknowledgment. To Dr. Bree the author is indebted for perusing the article on asthma, and his very liberal opinion on the same. To Dr. Young for a like attention to that on phthisis, and the valuable hints with which his opinion was accompanied. To Dr. Cooke, whose friendship he has experienced in many important instances, he is under a similar obligation for perusing, and, in a few instances, correcting the account of apoplexy and palsy: and to his excellent and judicious friend, Dr. James Johnson, for various hints concerning tropical diseases, and a perusal of some parts of the present volumes in which they are treated of.

The author has entered with a considerable degree of fulness into the different modifications of diseases, in order to adapt the work to foreign climates and stations as well as to domestic practice: for a system of medicine, to be complete, should be of universal application. To render it such, however, it is seldom necessary to do more than follow up the common diseases of a country into their respective varieties; for the general laws of the morbid action of the living principle are as permanent and universal as those of its natural action, and a really new SPECIES of disease is, perhaps, as much a phenomenon as a really new species of plant or animal. We see all these infinitely diversified by accidental circumstances, and particularly the circumstances of habit and climate; but the specific outlines are still preserved, and we are still capable of reducing them, under every disguise, to their proper relations, and of assigning them their proper posts. From a few nondescript skeletons occasionally found in the bowels of the earth, and particularly from the interesting museum of such established by M. Cuvier at Paris, we have reason to believe that a few species of animals have totally disappeared; as we have also, from the classifications of recent naturalists compared with those of earlier times, that a few species are now in being which had no existence in remote ages. And, in like manner, while a few species of diseases are now no longer to be found which are described by earlier writers, a few seem to have supplied their place, which are comparatively of modern origin. Yet upon the whole, the march of nature is but little interfered with in either case; and hence the prognostics and aphorisms of Hippocrates, the medical histories of Aretæus and Galen, of Rhazes and Avicenna, and the natural histories of Aristotle and Pliny, are transcripts of animal life in our own day, as well as in the times in which they were severally composed; and form important subjects of modern as it is well known they did of ancient study. The extensive family of fevers and spasmodic affections are, in the main, the same now as they are represented in the most ancient writings that have descended to us; the plague of Athens, as described by Thucydides, we shall find in the ensuing pages to be the prototype of what still occasionally takes place in Egypt and along the Barbary coast; and even the leprosy of the Levitical law, so minutely described by Moses, will be found, when the passage is closely and accurately rendered, still to retain its hold in the East, and to exhibit even the very same modifications as are noticed by the Hebrew legislator, and have been intermediately assigned to it by Celsus.

TABLE OF CLASSIFICATION.

CLASS I. CŒLIACA.

DISEASES OF THE DIGESTIVE FUNCTION.

ORD. I. ENTERICA.

AFFECTING THE ALIMENTARY CANAL.

GEN. I. ODONTIA.
MISDENTITION.

SPE. 1. O. DENTITIONIS.—*Teething.*
2. DOLOROSA.—*Toothache.*
3. STUPORIS.—*Tooth-edge.*
4. DEFORMIS.—*Deformity of the Teeth.*
5. EDENTULA.—*Toothlessness.*
6. INCRUSTANS.—*Tartar of the Teeth.*
7. EXCRESCENS.—*Excrescent Gums.*

GEN. II. PTYALISMUS.
PTYALISM.

SPE. 1. P. ACUTUS.—*Salivation.*
2. INERS.—*Drivelling.*

GEN. III. DYSPHAGIA.
DYSPHAGIA.

SPE. 1. D. CONSTRICTA.—*Constrictive Dysphagia.*
2. ATONICA.—*Atonic Dysphagia.*
3. GLOBOSA.—*Nervous Quinsy.*
4. UVULOSA.—*Uvular Dysphagia.*
5. LINGUOSA.—*Lingual Dysphagia.*
6. PHARYNGEA.—*Pharyngeal Dysphagia.*

GEN. IV. DIPSOSIS.
MORBID THIRST.

SPE. 1. D. AVENS.—*Immoderate Thirst.*
2. EXPERS.—*Thirstlessness.*

GEN. V. LIMOSIS.
MORBID APPETITE.

SPE. 1. L. AVENS.—*Voracity.*
2. EXPERS.—*Long Fasting.*
3. PICA.—*Depraved Appetite.*
4. CARDIALGIA.—*Heart-burn. Water-brash. Cardialgy.*
5. FLATUS.—*Flatulence.*
6. EMESIS.—*Sickness. Vomiting.*
7. DYSPEPSIA.—*Indigestion.*

GEN. VI. COLICA.
COLIC.

SPE. 1. C. ILEUS.—*Iliac Passion.*
2. RHACHIALGIA.—*Colic of Poictou. Painter's Colic.*
3. CIBARIA.—*Surfeit.*
4. FLATULENTA.—*Wind Colic.*
5. CONSTIPATA.—*Constipated Colic.*
6. CONSTRICTA.—*Constrictive Colic.*

GEN. VII. COPROSTASIS.
COSTIVENESS.

SPE. 1. C. CONSTIPATA.—*Constipation.*
2. OBSTIPATA.—*Obstipation.*

CLASS I. CŒLIACA.

ORD. I. ENTERICA.

GEN. VIII. DIARRHŒA.
LOOSENESS.

SPE. 1. D. FUSA.—*Feculent Looseness.*
2. BILIOSA.—*Bilious Looseness.*
3. MUCOSA.—*Mucous Looseness.*
4. ALBA.—*White Looseness.*
5. LIENTERIA.—*Lientery.*
6. SEROSA.—*Serous Looseness.*
7. TUBULARIS.—*Tubular Looseness.*

GEN. IX. CHOLERA
CHOLERA.

SPE. 1. C. BILIOSA.—*Bilious Cholera.*
2. FLATULENTA.—*Wind Cholera.*
3. SPASMODICA.—*Spasmodic Cholera.*

GEN. X. ENTEROLITHUS.
INTESTINAL CONCRETIONS.

SPE. 1. E. BEZOARDUS.—*Bezoar.*
2. CALCULUS.—*Intestinal Calculus.*
3. SCYBALUM.—*Scybalum.*

GEN. XI. HELMINTHIA.
WORMS.

SPE. 1. H. ALVI.—*Alvine Worms.*
2. PODICIS.—*Anal Worms.*
3. ERRATICA.—*Erratic Worms.*

GEN. XII. PROCTICA.
DISEASES ABOUT THE ANUS.

SPE. 1. P. SPASMODICA.—*Spasmodic Stricture of the Rectum.*
2. CALLOSA.—*Callous Stricture of the Rectum.*
3. TENESMUS.—*Tenesmus.*
4. MARISCA.—*Piles.*
5. EXANIA.—*Prolapse of the Fundament.*

ORD. II. SPLANCHNICA.

AFFECTING THE COLLATITIOUS VISCERA.

GEN. I. ICTERUS.
YELLOW JAUNDICE.

SPE. 1. I. CHOLŒUS.—*Biliary Jaundice.*
2. CHOLOLITHICUS.—*Gallstone Jaundice.*
3. SPASMODICUS.—*Spasmodic Jaundice.*
4. HEPATICUS.—*Hepatic Jaundice.*
5. INFANTUM.—*Jaundice of Infants.*

GEN. II. MELÆNA.
MELENA.

SPE. 1. M. CHOLŒA.—*Black or Green Jaundice.*
2. CRUENTA.—*Black Vomit.*

CLASS I. CŒLIACA.

ORD. II. SPLANCHNICA.

GEN. III. CHOLOLITHUS.
GALL-STONE.

SPE. 1. C. QUIESCENS.—*Quiescent Gall-stone.*
2. MEANS.—*Passing of Gall-stones.*

IV. PARABYSMA.
VISCERAL TURGESCENCE.

SPE. 1. P. HEPATICUM.—*Turgescence of the Liver.*
2. SPLENICUM.—*Turgescence of the Spleen.*
3. PANCREATICUM.—*Turgescence of the Pancreas.*
4. MESENTERICUM.—*Turgescence of the Mesentery.*
5. INTESTINALE.—*Turgescence of the Intestines.*
6. OMENTALE.—*Turgescence of the Omentum.*
7. COMPLICATUM.—*Turgescence compounded of various organs.*

CLASS II. PNEUMATICA.

DISEASES OF THE RESPIRATORY FUNCTION.

ORD. I. PHONICA.

AFFECTING THE VOCAL AVENUES.

GEN. I. CORYZA.
RUNNING AT THE NOSE.

SPE. 1. C. ENTONICA.—*Entonic Coryza.*
2. ATONICA.—*Atonic Coryza.*

II. POLYPUS.
POLYPUS.

SPE. 1. P. ELASTICUS.—*Compressible Polypus.*
2. CORIACEUS.—*Cartilaginous Polypus.*

III. RHONCHUS.
RATTLING IN THE THROAT.

SPE. 1. R. STERTOR.—*Snoring.*
2. CERCHNOS.—*Wheezing.*

IV. APHONIA.
DUMBNESS.

SPE. 1. A. ELINGUIUM.—*Elingual Dumbness.*
2. ATONICA.—*Atonic Dumbness.*
3. SURDORUM.—*Deaf Dumbness.*

V. DYSPHONIA.
DISSONANT VOICE.

SPE. 1. D. SUSURRANS.—*Whispering Voice.*
2. PUBERUM.—*Voice of Puberty.*
3. IMMODULATA.—*Immelodious Voice.*

VI. PSELLISMUS.
DISSONANT SPEECH.

SPE. 1. P. BAMBALIA.—*Stammering.*
2. BLÆSITAS.—*Misenunciation.*

CLASS II. PNEUMATICA.

ORD. II. PNEUMONICA.

AFFECTING THE LUNGS, THEIR MEMBRANES, OR MOTIVE POWER.

GEN. I. BEX.
COUGH.

SPE. 1. B. HUMIDA.—*Common or humid Cough.*
2. SICCA.—*Dry Cough.*
3. CONVULSIVA.—*Hooping cough.*

II. LARYNGYSMUS.
LARYNGIC SUFFOCATION.

SPE. 1. L. STRIDULUS.—*Stridulous Constriction of the Larynx.*

III. DYSPNŒA.
ANHELATION.

SPE. 1. D. CHRONICA.—*Short Breath.*
2. EXACERBANS.—*Exacerbating Anhelation.*

IV. ASTHMA.
ASTHMA.

SPE. 1. A. SICCUM.—*Dry or Nervous Asthma.*
2. HUMIDUM.—*Humid or common Asthma.*

V. EPHIALTES.
INCUBUS.

SPE. 1. E. VIGILANTIUM.—*Day-Mare.*
2. NOCTURNUS.—*Night-Mare.*

VI. STERNALGIA.
SUFFOCATIVE BREAST-PANG.

SPE. 1. S. AMBULANTIUM.—*Acute Breast-Pang.*
2. CHRONICA.—*Chronic Breast Pang.*

VII. PLEURALGIA.
PAIN IN THE SIDE.

SPE. 1. P. ACUTA.—*Stitch.*
2. CHRONICA.—*Chronic Pain in the Side.*

CLASS III. HÆMATICA.

DISEASES OF THE SANGUINEOUS FUNCTION

ORD. I. PYRECTICA.

FEVERS.

GEN. I. EPHEMERA.
DIARY FEVER.

SPE. 1. E. MITIS.—*Mild Diary Fever.*
2. ACUTA.—*Acute Diary Fever.*
3. SUDATORIA.—*Sweating Fever.*

II. ANETUS.
INTERMITTING FEVER. AGUE

SPE. 1. A. QUOTIDIANUS.—*Quotidian Ague.*
2. TERTIANUS.—*Tertian Ague*
3. QUARTANUS.—*Quartan Ague.*
4. ERRATICUS.—*Irregular Ague*
5. COMPLICATUS.—*Complicated Ague.*

III. EPANETUS.
REMITTENT FEVER

SPE. 1. E. MITIS.—*Mild Remittent.*

CLASS III. HÆMATICA.

ORD. I. PYRECTICA.

GEN. III. EPANETUS.
SPE. 2. E. MALIGNUS.—*Malignant Remittent.**
3. HECTICUS.—*Hectic Fever.*

IV. ENECIA.
CONTINUED FEVER.
SPE. 1. E. CAUMA.—*Inflammatory Fever.*
2. TYPHUS.—*Typhus Fever.*
3. SYNOCHUS.—*Synochal Fever.*

ORD. II. PHLOGOTICA.

INFLAMMATIONS.

GEN. I. APOSTEMA.
APOSTEME.
SPE. 1. A. COMMUNE.—*Common Apostume.*
2. PSOATICUM.—*Psoas Abscess.*
3. HEPATICUM.—*Abscess of the Liver.*
4. EMPYEMA.—*Lodgment of Matter in the Chest.*
5. VOMICA.—*Vomica.*

II. PHLEGMONE.
PHLEGMON.
SPE. 1. P. COMMUNIS.—*Common Phlegmon.*
2. PARULIS.—*Gum-bile.*
3. PAROTIDEA.—*Parotid Phlegmon.*
4. MAMMÆ.—*Abscess of the Breast.*
5. BUBO.—*Bubo.*
6. PHIMOTICA.—*Phimotic Phlegmon.*

III. PHYMA.
TUBER.
SPE. 1. P. HORDEOLUM.—*Sty.*
2. FURUNCULUS.—*Bile.*
3. SYCOSIS.—*Ficous Phyma.*
4. ANTHRAX.—*Carbuncle.*

IV. IONTHUS.
WHELK.
SPE. 1. I. VARUS.—*Stone-pock.*
2. CORYMBYFER.—*Carbuncled Face. Rosy Drop.*

V. PHLYSIS.
PHLYSIS.
SPE. 1. P. PARONYCHIA.—*Whitlow.*

VI. ERYTHEMA.
INFLAMMATORY BLUSH.
SPE. 1. E. ŒDEMATOSUM.—*Edematous Erythema.*
2. ERYSIPELATOSUM.—*Erysipelatous Erythema.*
3. GANGRÆNOSUM.—*Gangrenous Erythema.*
4. VESICULARE.—*Vesicular Erythema.*
5. ANATOMICUM.—*Erythema from Dissection.*
6. PERNIO.—*Chilblain.*
7. INTERTRIGO.—*Fret.*

* α Autumnal Remittent. β Yellow Fever. γ Burning Remittent. δ Asthenic Remittent.

CLASS III. HÆMATICA.

ORD II. PHLOGOTICA.

GEN. VII. EMPRESMA.
VISCERAL INFLAMMATION.
SPE. 1. E. CEPHALITIS.—*Inflammation of the Brain.**
2. OTITIS.—*Earache.*
3. PAROTITIS.—*Mumps.*
4. PARISTHMITIS.—*Quinsy.*
5. LARYNGITIS.—*Inflammation of the Larynx.*
6. BRONCHLEMMITIS.—*Croup.*
7. PNEUMONITIS.—*Peripneumony.*
8. PLEURITIS.—*Pleurisy.*
9. CARDITIS.—*Inflammation of the Heart.*
10. PERITONITIS.—*Inflammation of the Peritonæum.*
11. GASTRITIS.—*Inflammation of the Stomach.*
12. ENTERITIS.—*Inflammation of the Bowels.*
13. HEPATITIS.—*Inflammation of the Liver.*
14. SPLENITIS.—*Inflammation of the Spleen.*
15. NEPHRITIS.—*Inflammation of the Kidneys.*
16. CYSTITIS.—*Inflammation of the Bladder.*
17. HYSTERITIS.—*Inflammation of the Womb.*
18. ORCHITIS.—*Inflammation of the Testicle.*

VIII. OPHTHALMIA.
OPHTHALMIA.
SPE. 1. O. OPHTHALMITIS.—*Inflammation of the whole Eyeball.*
2. EXTERNA.—*Inflammation of the external Tunics.*
3. INTERNA.—*Inflammation of the internal Parts of the Eye.*
4. STAPHYLOMA.—*Protuberant Eye.*
5. ECTROPIUM.—*Everted Eyelid.*
6. ENTROPIUM.—*Inverted Eyelid.*

IX. CATARRHUS.
CATARRH.
SPE. 1. C. COMMUNIS.—*Cold in the Head or Chest.*
2. EPIDEMICUS.—*Influenza.*

X. DYSENTERIA.
DYSENTERY.
SPE. 1. D. ACUTA.—*Acute Dysentery.*
2. CHRONICA.—*Chronic Dysentery.*

XI. BUCNEMIA.
TUMID LEG.
SPE. 1. B. SPARGANOSIS.—*Puerperal Tumid Leg.*
2. TROPICA.—*Tumid Leg of hot Climates.*

XII. ARTHROSIA.
ARTICULAR INFLAMMATION.
SPE. 1. A. ACUTA.—*Acute Rheumatism.*

* α Brain Fever. β Acute Dropsy of the Head.

CLASS III. HÆMATICA.

ORD. II. PHLOGOTICA.

GEN. XII. ARTHROSIA.
SPE. 2. A. CHRONICA.—*Chronic Rheumatism.*
3. PODAGRA.—*Gout.*
4. HYDARTHRUS.—*White-swelling.*

ORD. III. EXANTHEMATICA.

ERUPTIVE FEVERS. EXANTHEMS.

GEN. I. ENANTHESIS.
RASH EXANTHEM.
SPE. 1. E. ROSALIA.—*Scarlet Fever.*
2. RUBEOLA.—*Measles.*
3. URTICARIA.—*Nettle Rash.*

II. EMPHLYSIS.
ICHOROUS EXANTHEM.
SPE. 1. E. MILIARIA.—*Miliary Fever.*
2. APHTHA.—*Thrush.*
3. VACCINIA.—*Cow-pox.*
4. VARICELLA.—*Water-pox.*
5. PEMPHIGUS.—*Vesicular, or Bladdery Fever.*
6. ERYSIPELAS.—*St. Anthony's Fire.*

III. EMPYESIS.
PUSTULOUS EXANTHEM.
SPE. 1. E. VARIOLA.—*Smallpox.*

IV. ANTHRACIA.
CARBUNCULAR EXANTHEM.
SPE. 1. A. PESTIS.—*Plague.*
2. RUBULA.—*Yaws.*

ORD. IV. DYSTHETICA.

CACHEXIES.

GEN. I. PLETHORA.
PLETHORA.
SPE. 1. P. ENTONICA.—*Sanguine Plethora.*
2. ATONICA.—*Serous Plethora.*

II. HÆMORRHAGIA.
HEMORRHAGE.
SPE. 1. H. ENTONICA.—*Entonic Hemorrhage.*
2. ATONICA.—*Atonic Hemorrhage.*

III. MARASMUS.
EMACIATION.
SPE. 1. M. ATROPHIA.—*Atrophy.*
2. ANHÆMIA.—*Exsanguinity.*
3. CLIMACTERICUS.—*Decay of Nature.*
4. TABES.—*Decline.*
5. PHTHISIS.—*Consumption.*

IV. MELANOSIS.
MELANOSE.
SPE. 1. M. TUBERCULARIS.—*Tubercular Melanose.*

V. STRUMA.
SCROFULA.
SPE. 1. S. VULGARIS.—*King's Evil.*

VI. CARCINUS.
CANCER.
SPE. 1. C. VULGARIS.—*Common Cancer.*

CLASS III. HÆMATICA.

ORD. IV. DYSTHETICA.

GEN. VII. LUES.
VENEREAL DISEASE.
SPE. 1. L. SYPHILIS.—*Pox.*
2. SYPHILODES.—*Bastard Pox.*

VIII. ELEPHANTIASIS.
ELEPHANT SKIN.
SPE. 1. E. ARABICA.—*Arabian Elephantiasis. Black Leprosy.*
2. ITALICA.—*Italian Elephantiasis.*
3. ASTURIENSIS.—*Asturian Elephantiasis.*

IX. CATACAUSIS.
CATACAUSIS.
SPE. 1. C. EBRIOSA.—*Inebriate Catacausis.*

X. PORPHYRA.
SCURVY.
SPE. 1. P. SIMPLEX.—*Petechial Scurvy.*
2. HÆMORRHAGICA.—*Land Scurvy.*
3. NAUTICA.—*Sea Scurvy.*

XI. EXANGIA.
EXANGIA.
SPE. 1. E. ANEURISMA.—*Aneurism.*
2. VARIX.—*Varix.*
3. CYANIA.—*Blue-skin.*

XII. GANGRÆNA.
GANGRENE:
SPE. 1. G. SPHACELUS.—*Mortification.*
2. USTILAGINEA.—*Mildew Mortification.*
3. NECROSIS.—*Dry Gangrene.*
4. CARIES.—*Caries.*

XIII. ULCUS.
ULCER.
SPE. 1. U. INCARNANS.—*Simple healing Ulcer.*
2. VITIOSUM.—*Depraved Ulcer.*
3. SINUOSUM.—*Sinuous Ulcer.*
4. TUBERCULOSUM.—*Warty excrescent Ulcer.*
5. CARIOSUM.—*Carious Ulcer.*

CLASS IV. NEUROTICA.

DISEASES OF THE NERVOUS FUNCTION.

ORD. I. PHRENICA.

AFFECTING THE INTELLECT.

GEN. I. ECPHRONIA.
INSANITY. CRAZINESS.
SPE. 1. E. MELANCHOLIA.—*Melancholy.*
2. MANIA.—*Madness.*

II. EMPATHEMA.
UNGOVERNABLE PASSION.
SPE. 1. E. ENTONICUM.—*Impassioned Excitement.*
2. ATONICUM.—*Impassioned Depression.*
3. INANE.—*Hairbrained Passion.*

III. ALUSIA.
ILLUSION. HALLUCINATION.
SPE. 1. A. ELATIO.—*Sentimentalism. Mental Extravagance*

CLASS IV. NEUROTICA.

ORD. I. PHRENICA.

GEN. III. ALUSIA.
SPE. 2. A. HYPOCHONDRIAS.—*Hypochondrism. Low Spirits.*

IV. APHELXIA.
REVERY.
SPE. 1. A. SOCORS.—*Absence of Mind.*
2. INTENTA.—*Abstraction of Mind.*
3. OTIOSA.—*Brown Study.*

V. PARONIRIA.
SLEEP DISTURBANCE.
SPE. 1. P. AMBULANS.—*Sleep-walking.*
2. LOQUENS.—*Sleep-talking.*
3. SALAX.—*Night Pollution.*

VI. MORIA.
FATUITY.
SPE. 1. M. IMBECILIS.—*Imbecility.*
2. DEMENS.—*Irrationality.*

ORD. II. ÆSTHETICA.

AFFECTING THE SENSATION.

GEN. I. PAROPSIS.
MORBID SIGHT.
SPE. 1. P. LUCIFUGA.—*Night Sight.*
2. NOCTIFUGA.—*Day Sight.*
3. LONGINQUA.—*Long Sight.*
4. PROPINQUA.—*Short Sight.*
5. LATERALIS.—*Skew Sight.*
6. ILLUSORIA.—*False Sight.*
7. CALIGO.—*Opaque Cornea.*
8. GLAUCOSIS.—*Humoral Opacity.*
9. CATARACTA.—*Cataract.*
10. SYNIZESIS.—*Closed Pupil.*
11. AMAUROSIS.—*Drop Serene.*
12. STRABISMUS.—*Squinting.*

II. PARACUSIS.
MORBID HEARING.
SPE. 1. P. ACRIS.—*Acrid Hearing.*
2. OBTUSA.—*Hardness of Hearing.*
3. PERVERSA.—*Perverse Hearing.*
4. DUPLICATA.—*Double Hearing.*
5. ILLUSORIA.—*Imaginary Sounds.*
6. SURDITAS.—*Deafness.*

III. PAROSMIS.
MORBID SMELL.
SPE. 1. P. ACRIS.—*Acrid Smell.*
2. OBTUSA.—*Obtuse Smell.*
3. EXPERS.—*Want of Smell.*

IV. PARAGEUSIS.
MORBID TASTE.
SPE. 1. P. ACRIS.—*Acrid Taste.*
2. OBTUSA.—*Obtuse Taste.*
3. EXPERS.—*Want of Taste.*

V. PARAPSIS.
MORBID TOUCH.
SPE. 1. P. ACRIS.—*Acrid Sense of Touch or general Feeling.*
2. EXPERS.—*Insensibility of Touch or general Feeling.*
3. ILLUSORIA.—*Illusory Sense of Touch or general Feeling.*

VI. NEURALGIA.
NERVE-ACHE.
SPE. 1. N. FACIEL.—*Nerve-ache of the Face.*

CLASS IV. NEUROTICA.

ORD. II. ÆSTHETICA.

GEN. VI. NEURALGIA.
SPE. 2. N. PEDIS.—*Nerve-ache of the Foot.*
3. MAMMÆ.—*Nerve-ache of the Breast.*

ORD. III. CINETICA.

AFFECTING THE MUSCLES.

GEN. I. ENTASIA.
CONSTRICTIVE SPASM.
SPE. 1. E. PRIAPISMUS.—*Priapism.*
2. LOXIA.—*Wry Neck.*
3. RHACHYBIA.—*Muscular Distortion of the Spine.*
4. ARTICULARIS.—*Muscular Stiff-joint.*
5. SYSTREMMA.—*Cramp.*
6. TRISMUS.—*Locked-jaw.*
7. TETANUS.—*Tetanus.*
8. LYSSA.—*Rabies. Canine Madness.*
9. ACROTISMUS.—*Suppressed Pulse.*

II. CLONUS.
CLONIC SPASM.
SPE. 1. C. SINGULTUS.—*Hiccough.*
2. STERNUTATIO.—*Sneezing.*
3. PALPITATIO.—*Palpitation.*
4. NICTITATIO.—*Twinkling of the Eyelids.*
5. SUBSULTUS.—*Twitches of the Tendons.*
6. PANDICULATIO.—*Stretching.*

III. SYNCLONUS.
SYNCLONIC SPASM.
SPE. 1. S. TREMOR.—*Trembling.*
2. CHOREA.—*St. Vitus's Dance.*
3. BALLISMUS.—*Shaking Palsy.*
4. RAPHANIA.—*Raphania.*
5. BERIBERIA.—*Barbiers.*

ORD. IV. SYSTATICA.

AFFECTING SEVERAL, OR ALL THE SENSORIAL POWERS, SIMULTANEOUSLY.

GEN. I. AGRYPNIA.
SLEEPLESSNESS.
SPE. 1. A. EXCITATA.—*Irritative Wakefulness.*
2. PERTÆSA.—*Chronic Wakefulness.*

II. DYSPHORIA.
RESTLESSNESS.
SPE. 1. D. SIMPLEX.—*Fidgets.*
2. ANXIETAS.—*Anxiety.*

III. ANTIPATHIA.
ANTIPATHY.
SPE. 1. A. SENSILIS.—*Sensile Antipathy.*
2. INSENSILIS.—*Insensile Antipathy.*

IV. CEPHALÆA.
HEADACHE.
SPE. 1. C. GRAVANS.—*Stupid Headache.*
2. INTENSA.—*Chronic Headache.*
3. HEMICRANIA.—*Megrim.*
4. PULSATILIS.—*Throbbing Headache.*
5. NAUSEOSA.—*Sick Headache.*

CLASS IV. NEUROTICA.

ORD. IV. SYSTATICA.

GEN. V. DINUS.
DIZZINESS.
SPE. 1. D. VERTIGO.—*Vertigo.*

VI. SYNCOPE.
SYNCOPE.
SPE. 1. S. SIMPLEX.—*Swooning.*
2. RECURRENS.—*Fainting Fit.*

VII. SYSPASIA.
COMATOSE SPASM.
SPE. 1. S. CONVULSIO.—*Convulsion.*
2. HYSTERIA.—*Hysterics.*
3. EPILEPSIA.—*Epilepsy.*

VIII. CARUS.
TORPOR.
SPE. 1. C. ASPHYXIA.—*Asphyxia. Suspended Animation.*
2. ECSTASIS.—*Ecstasy.*
3. CATALEPSIA.—*Catalepsy.*
4. LETHARGUS.—*Lethargy.*
5. APOPLEXIA.—*Apoplexy.*
6. PARALYSIS.—*Palsy.*

CLASS V. GENETICA.

DISEASES OF THE SEXUAL FUNCTION.

ORD. I. CENOTICA.

AFFECTING THE FLUIDS.

GEN. I. PARAMENIA.
MISMENSTRUATION.
SPE. 1. P. OBSTRUCTIONIS.—*Obstructed Menstruation.*
2. DIFFICILIS.—*Laborious Menstruation.*
3. SUPERFLUA.—*Excessive Menstruation.*
4. ERRORIS.—*Vicarious Menstruation.*
5. CESSATIONIS.—*Irregular Cessation of the Menses.*

II. LEUCORRHŒA.
WHITES.
SPE. 1. L. COMMUNIS.—*Common Whites.*
2. NABOTHI.—*Labour-show.*
3. SENESCENTIUM.—*Whites of advanced Life.*

III. BLENORRHŒA.
GONORRHŒA.
SPE. 1. B. SIMPLEX.—*Simple urethral Running.*
2. LUODES.—*Clap.*
3. CHRONICA.—*Gleet.*

IV. SPERMORRHŒA.
SEMINAL FLUX.
SPE. 1. S. ENTONICA.—*Entonic Seminal Flux.*
2. ATONICA.—*Atonic Seminal Flux.*

V. GALACTIA.
MISLACTATION.
SPE. 1. G. PRÆMATURA.—*Premature Milk-flow.*
2. DEFECTIVA.—*Deficient Milk-flow.*

CLASS V. GENETICA.

ORD. I. CENOTICA.

GEN. V. GALACTIA.
SPE. 3. G. DEPRAVATA.—*Depraved Milk-flow.*
4. ERRATICA.—*Erratic Milk-flow.*
5. VIRORUM.—*Milk-flow in Males.*

ORD. II. ORGASTICA.

AFFECTING THE ORGASM.

GEN. I. CHLOROSIS.
GREEN SICKNESS.
SPE. 1. C. ENTONICA.—*Entonic Green Sickness.*
2. ATONICA.—*Atonic Green Sickness.*

II. PRŒOTIA.
GENITAL PRECOCITY.
SPE. 1. P. MASCULINA.—*Male Precocity.*
2. FEMININA.—*Female Precocity.*

III. LAGNESIS.
LUST.
SPE. 1. L. SALACITAS.—*Salacity.*
2. FUROR.—*Lascivious Madness.*

IV. AGENESIA.
MALE STERILITY.
SPE. 1. A. IMPOTENS.—*Male Impotency*
2. DYSPERMIA.—*Seminal Miscarriage.*
3. INCONGRUA.—*Copulative Incongruity.*

V. APHORIA.
FEMALE STERILITY. BARRENNESS.
SPE. 1. A. IMPOTENS.—*Barrenness of Impotency.*
2. PARAMENICA.—*Barrenness of Mismenstruation.*
3. INPERCITA.—*Barrenness of Irrespondence.*
4. INCONGRUA.—*Barrenness of Incongruity.*

VI. ÆDOPTOSIS.
GENITAL PROLAPSE.
SPE. 1. A. UTERI.—*Falling down of the Womb.*
2. VAGINÆ.—*Prolapse of the Vagina.*
3. VESICÆ.—*Prolapse of the Bladder.*
4. COMPLICATA.—*Complicated Genital Prolapse.*
5. POLYPOSA.—*Genital Excrescence.*

ORD. III. CARPOTICA.

AFFECTING THE IMPREGNATION.

GEN. I. PARACYESIS.
MORBID PREGNANCY.
SPE. 1. P. IRRITATIVA.—*Constitutional Derangement of Pregnancy.*
2. UTERINA.—*Local Derangement of Pregnancy.*
3. ABORTUS.—*Abortion.*

CLASS V. GENETICA.

ORD. III. CARPOTICA.

GEN. II. PARODYNIA.
MORBID LABOUR.

SPE. 1. P. ATONICA.—*Atonic Labour.*
2. IMPLASTICA.—*Unpliant Labour.*
3. SYMPATHETICA.—*Complicated Labour.*
4. PERVERSA.—*Preternatural Presentation.*
5. AMORPHICA.—*Impracticable Labour.*
6. PLURALIS.—*Multiplicate Labour.*
7. SECUNDARIA.—*Sequential Labour.*

III. ECCYESIS.
EXTRA-UTERINE FETATION.

SPE. 1. E. OVARIA.—*Ovarian Exfetation.*
2. TUBALIS.—*Tubal Exfetation.*
3. ABDOMINALIS.—*Abdominal Exfetation.*

IV. PSEUDOCYESIS.
SPURIOUS PREGNANCY.

SPE. 1. P. MOLARIS.—*Mole.*
2. INANIS.—*False Conception.*

CLASS VI. ECCRITICA.

DISEASES OF THE EXCERNENT FUNCTION.

ORD. I. MESOTICA.

AFFECTING THE PARENCHYMA.

GEN. I. POLYSARCIA.
CORPULENCY.

SPE. 1. P. ADIPOSA.—*Obesity.*

II. EMPHYMA.
TUMOUR.

SPE. 1. E. SARCOMA.—*Sarcomatous Tumour.*
2. ENCYSTIS.—*Encysted Tumour.*
3. EXOSTOSIS.—*Bony Tumour.*

III. PAROSTIA.
MIS-OSSIFICATION.

SPE. 1. P. FRAGILIS.—*Fragility of the Bones.*
2. FLEXILIS.—*Flexility of the Bones.*

IV. CYRTOSIS.
CONTORTION OF THE BONES.

SPE. 1. C. RHACHIA.—*Rickets.*
2. CRETINISMUS.—*Cretinism.*

V. OSTHEXIA.
OSTHEXY.

SPE. 1. O. INFARCIENS.—*Parenchymatous Osthexy.*
2. IMPLEXA.—*Vascular Osthexy.*

ORD. II. CATOTICA.

AFFECTING INTERNAL SURFACES.

GEN. I. HYDROPS.
DROPSY.

SPE. 1. H. CELLULARIS.—*Cellular Dropsy.*

CLASS VI. ECCRITICA.

ORD. II. CATOTICA.

GEN. I. HYDROPS.

SPE. 2. H. CAPITIS.—*Dropsy of the Head.*
3. SPINÆ.—*Dropsy of the Spine.*
4. THORACIS.—*Dropsy of the Chest.*
5. ABDOMINIS.—*Dropsy of the Belly.*
6. OVARII.—*Dropsy of the Ovaries*
7. TUBALIS.—*Dropsy of the Fallopian Tubes.*
8. UTERI.—*Dropsy of the Womb*
9. SCROTI.—*Dropsy of the Scrotum.*

II. EMPHYSEMA.
INFLATION. WIND DROPSY

SPE. 1. E. CELLULARE.—*Cellular Inflation.*
2. ABDOMINIS.—*Tympany.*

III. PARURIA.
MIS-MICTURITION.

SPE. 1. P. INOPS.—*Destitution of Urine.*
2. RETENTIONIS.—*Stoppage of Urine.*
3. STILLATITIA.—*Strangury.*
4. MELLITA.—*Saccharine Urine Diabetes.*
5. INCONTINENS.—*Incontinence of Urine.*
6. INCOCTA.—*Unassimilated Urine.*
7. ERRATICA.—*Erratic Urine.*

IV. LITHIA.
URINARY CALCULUS

SPE. 1. L. RENALIS.—*Renal Calculus.*
2. VESICALIS.—*Stone in the Bladder.*

ORD. III. ACROTICA.

AFFECTING THE EXTERNAL SURFACE

GEN. I. EPHIDROSIS.
MORBID SWEAT.

SPE. 1. E. PROFUSA.—*Profuse Sweat.*
2. CRUENTA.—*Bloody Sweat.*
3. PARTIALIS.—*Partial Sweat.*
4. DISCOLOR.—*Coloured Sweat*
5. OLENS.—*Scented Sweat.*
6. ARENOSA.—*Sandy Sweat.*

II. EXANTHESIS.
CUTANEOUS BLUSH.

SPE. 1. E. ROSEOLA.—*Rose Rash.*

III. EXORMIA.
PAPULOUS SKIN.

SPE. 1. E. STROPHULUS.—*Gum Rash*
2. LICHEN.—*Lichenous Rash.*
3. PRURIGO.—*Pruriginous Rash*
4. MILIUM.—*Millet Rash.*

IV. LEPIDOSIS.
SCALE SKIN.

SPE. 1. L. PITYRIASIS.—*Dandruff.*
2. LEPRIASIS.—*Leprosy.*
3. PSORIASIS.—*Dry Scall.*
4. ICHTHYIASIS.—*Fish Skin.*

V. ECPHLYSIS.
BLAINS.

SPE. 1. E. POMPHOLYX.—*Water-blebs.*

CLASS VI. ECCRITICA.

ORD. III. ACROTICA.

GEN. V. ECPHLYSIS.
SPE. 2. E. HERPES.*—*Tetter.*
3. RHYPIA.—*Sordid Blain.*
4. ECZEMA.—*Heat Eruption.*

VI. ECPYESIS.
HUMID SCALL.
SPE. 1. E. IMPETIGO.—*Running Scall.*
2. PORRIGO.†—*Scabby Scall.*
3. ECTHYMA.—*Papulous Scall.*
4. SCABIES.—*Itch.*

VII. MALIS.
CUTANEOUS VERMINATION.
SPE. 1. M. PEDICULI.—*Lousiness.*
2. PULICIS.—*Fleabites.*
3. ACARI.—*Tick-bite.*
4. FILARIÆ.—*Guinea Worm.*
5. ŒSTRI.—*Gadfly Bite.*
6. GORDII.—*Hair Worm.*

VIII. ECPHYMA.
CUTANEOUS EXCRESCENCE.
SPE. 1. E. CARUNCULA.—*Caruncle.*

* γ Shingles. δ Ringworm. † β Scalled head.

CLASS VI. ECCRITICA.

ORD. III. ACROTICA.

GEN. VIII. ECPHYMA.
SPE. 2. E. VERRUCA.—*Wart.*
3. CLAVUS.—*Corn.*
4. CALLUS.—*Callus.*

IX. TRICHOSIS.
MORBID HAIR.
SPE. 1. T. SETOSA.—*Bristly Hair.*
2. PLICA.—*Matted Hair.*
3. HIRSUTIES.—*Extraneous Hair.*
4. DISTRIX.—*Forky Hair.*
5. POLIOSIS.—*Gray Hairs.*
6. ATHRIX.—*Baldness.*
7. AREA.—*Areated Hair.*
8. DECOLOR.—*Miscoloured Hair.*
9. SENSITIVA.—*Sensitive Hair.*

X. EPICHROSIS.
MACULAR SKIN.
SPE. 1. E. LEUCASMUS.—*Veal Skin.*
2. SPILUS.—*Mole.*
3. LENTICULA.—*Freckles.*
4. EPHELIS.—*Sunburn.*
5. AURIGO.—*Orange Skin.*
6. PŒCILIA.—*Piebald Skin.*
7. ALPHOSIS.—*Albino Skin.*

CLASS I.

CŒLIACA.

DISEASES OF THE DIGESTIVE FUNCTION.

ORDER I.

ENTERICA.

DISEASES AFFECTING THE ALIMENTARY CANAL.

II.

SPLANCHNICA.

DISEASES AFFECTING THE COLLATITIOUS VISCERA.

CLASS I.

PHYSIOLOGICAL PROEM.

According to the physiological arrangement proposed in this work, the first class of diseases consists of those which primarily affect, or commence in, the digestive organs, and impede the digestive function. I say *primarily* affect these organs, because they may be affected in a secondary manner, by sympathy or induction, in consequence of diseases which originate elsewhere, and, on this account, do not belong to the present class.

Now, in order to obtain a clear idea of the nature of the diseases before us, it is necessary to have a distinct knowledge of the organs which are the seat of them, and of the function which they embrace. To follow up this inquiry into a very minute detail, is the joint province of anatomy, physiology, and animal chymistry; and a finished practitioner must derive his information from these three sources collectively, pursued through an extent of many volumes. But, for our immediate purpose, it may be sufficient to give a general view of the subject.

No animal function displays a greater diversity of means for its performance, than that of digestion: and, perhaps, the only point in which animals of all classes agree upon this subject, is in the possession of an internal canal or cavity, of some kind or other, into which the food is introduced, and prepared for nutrition: an agreement, regarded as one of the leading features, by which the animal structure is distinguished from the vegetable.

[Some form of an alimentary cavity is, perhaps, the best criterion of an animal hitherto suggested. Cuvier distinctly states, that he knows of no animal unprovided with such an organ.—(*Dict. des Sciences Med.*, tom. ii. p. 145.) On the other hand, plants do not contain any large, separate, internal cavity for the reception of their nourishment, which they absorb by pores on their surface, and especially by their roots and leaves. As the generality of animals possess the power of locomotion, they could not have roots, by which they would be fixed in one situation. Most of them take their supply of food at once, according to need and opportunity, carry it about with them, and digest it at their leisure. This object is fulfilled by an alimentary cavity, whose internal pores, for imbibing the nutriment, may be compared to vegetable roots, which take up food from the soil. Hence Boërhaave used to say, that animals have roots within them; and the villi of the small intestines, as furnishing the general frame with the nutriment applied to their absorbent mouths, are beautifully denominated by Béclard the radicles of animal life. A distinct alimentary cavity, generally having a reference to locomotion, is then, as Cuvier remarks, one of the most invariable characters of an animal. A single mouth, he says, which some naturalists have fixed upon as a criterion, and contrasted with the multiplicity of the pores of the roots of vegetables, is less constant; for some animals of the family of medusa have several mouths, yet only one common stomachic cavity.

The superior relative importance of the digestive organs in the animal economy is further illustrated by the fact, that the existence of parts of them may be traced in the early stages of the fœtus, long before any rudiment of the spinal marrow, brain, or heart, can be detected. In this instance we also find the principle confirmed, that parts, first formed, are most rarely wanting. Thus, monsters have been met with, which consisted of nothing more than an abdomen, more or less perfect; but the separate development of a head, or chest, has never been observed. Man may be so incompletely developed, as to approach the point constituting the full organization of certain lower animals, and to appear only as a mere digestive cavity

But, simple as his organization may be, the zoophite, which exhibits a like simplicity, can live and reproduce itself, such organization being natural to it; but man must perish; for his existence, as a mere unfinished sketch of himself, would be a contravention of the laws of nature.*]

The alimentary cavity in man extends from the mouth through the whole range of the intestinal canal; and hence, its different parts are of very different diameters. In the mouth, where it commences, and in the pharynx, it is comparatively wide; it contracts in the œsophagus; then again widens to form the stomach, and afterward contracts again into the tube of the intestines. The intestinal tube itself is also of various diameters, in different parts of its extent, and it is chiefly on this diversity of magnitude that anatomists have established its divisions. Its general length is five or six times that of the man himself; and, in children, not less than ten or twelve times; [digestion in them being particularly active, from the greater supplies of nutriment required for growth and reparation. Meckel found the length of the small intestines very irregular in different persons, and that it varied from thirteen to twenty-seven feet, without any proportionate difference in the stature of the body. In some animals, the intestinal canal is imperforate, the dross of the food being rejected by the mouth. This was once supposed to be the case in the medicinal leech: but Cuvier, Blumenbach, and Carus, all agree, in opposition to Dumeril, that the leech has a minute anus, from which, however, only a little fecal matter is discharged, most of it being voided by the mouth. No anus has yet been satisfactorily detected in the tape-worm.—(*Carus's Comp. Anat.*, vol. ii. p. 15.) In the actiniæ, one aperture combines the two offices of mouth and anus.]—(*Carus*, p. 3.)

* In the human subject, the anus is sometimes imperforate at birth, with a preternatural outlet, formed in some neighbouring part or organ, to supply its place, in which case the feces have been discharged by the urethra, the vagina, the navel, or the groin. An extraordinary instance of such accommodation is that of a girl, who from birth was imperforate in the anus and meatus urinarius; in fact, in the whole division of the vulva; and who, to the age of fourteen, had regularly discharged her urine by the breasts, and her feces by a natural vomiting or rejection from the stomach.—(*Samml. Med. Wahrnehm.*, b. viii. p. 29.)

Generally speaking, the extent of the digestive cavity bears a relation to the nature of the aliments by which the individual is designed to be nourished. The less analogous these aliments are to the substance of the animal they are to recruit, the longer they must remain in the body, to undergo the changes that are to assimilate them. Hence, the intestinal tube of herbivorous animals is for the most part (for we still meet with exceptions) very long; or, in particular portions, exceedingly capacious; in various kinds remarkably complicated, and often double or triple. Thus, in the horse, the large intestines are of enormous size, and dilated into sacculi, while the cœcum is as capacious as the stomach. In the ruminant animals, besides the peculiar complexity of the stomach, the alimentary canal is twenty-seven times the length of the body. On the contrary, carnivorous animals have a short and straight canal; their food, being already of their own nature, containing a larger quantity of nourishment in less bulk, and hence demanding a smaller proportion of time and space to become fit for use. [In them every circumstance concurs to accelerate the passage of the alimentary matter. It undergoes no mastication; it is retained but a short time in the stomach; the intestine has no folds, nor valves; its diameter is small; and the whole canal, when compared to the body, is extremely short, being only as three or five to one. Whales, however, have a longer canal than other carnivorous mammalia, their stomach is complicated, and the intestine has longitudinal folds. Indeed, carnivorous mammalia, of aquatic habits, generally possess a considerable length of intestine; a point in which they differ from most other animals of that class. The shortness of the intestinal canal in the generality of fishes, is compensated by the length of time the food, which is usually animal, is detained in it. A perch has been observed to take food but once in ten days or a fortnight.—(*Home's Comp Anat.*, p. 340.)

In omnivorous animals, the canal is not so long as it is in the herbivorous, nor so short as it is in the carnivorous. Thus, in the rat, its proportion to the body is as eight to one; in the pig, thirteen to one; and in man, six or seven to one. In him the diminution in length is compensated by the numerous valvulæ conniventes and the preparation of the food by cookery.—(*Blumenbach's Comp. Anat.*, p. 178.) The domestic cat, which eats bread as well as flesh, has an alimentary canal considerably longer than that of the wild cat.]

The digestive canal of man is less capacious and complex than that of most mammalia, which take only vegetable food; yet, larger and more complicated than that of other mammalia, which live entirely on flesh. Hence, man seems to be capable of subsisting either on animal or vegetable food; and, from the nature of his digestive as well as of various other organs, is better qualified for every diversity of aliment and climate than any other animal. Thus, many nations in a savage state live almost, perhaps altogether, on fruits and roots; as those of the yam, beet, and potato, the bread-fruit-tree, bread-nut (*brosimum alicastrum*), sweet-chestnut, banana, cabbage-tree, palm (*areca oleracea*), and meal-bark (*cycas circinalis*). Others live on raw animal flesh, or flesh of the coarsest kind, as that of one species at least of the walrus (*trichecus dudong*), the sea-bear, and sea-calf. The Greenlander feeds voraciously on the skin and fins of the nord-capon, and on the flesh of whales. Many African tribes are said

* Andral, Anat. Pathol., t. ii. p. 131. The stomach is formed subsequently to the intestines, and is more frequently wanting.

to live on dead lions and hippopotami. Dogs are eaten in the South Sea islands, horses in Tartary, and cats in many parts as a substitute for rabbits. Among numerous tribes of savages, indeed, the flesh of man himself is still dressed for food: the custom may have been more extensive formerly than in the present day; but it still prevails in several of the Australasian isles, and is even exhibited in New-Zealand, where the inhabitants are nevertheless peculiarly intelligent, and disposed to adopt the manners of Europeans. The Hindoos subsist chiefly on rice and maize, and will not touch flesh of any kind. Many tribes of wandering or nomadic Moors on gums, principally gum seneca. The Kamtschadales, and the wretched inhabitants of the neighbouring shores, on fishes, or coarse fish-oil mixed into a paste with sawdust, or the rasped fibres of indigenous plants: while the more polished and luxurious nations of Europe live on solid and liquid foods of every description.* Yet, it should not be forgotten that, in Ireland and some other places, the only aliment subsisted upon in extensive and populous communities, whose poverty prevents them from obtaining any other, is the potato.

Man, therefore, is omnivorous; but he is not the only omnivorous animal in the world: for the great Author of nature is perpetually showing us that, though he operates by general principles, he is in every instance the lord, and not the slave, of his own laws. And hence, among quadrupeds, the swine, and, among insects, the ant (and more examples might be adduced if necessary), possess as omnivorous a power as man himself, and feed equally on the fleshy parts of animals, and on grain, and the sweet juices of plants. [In this respect, there is a power of accommodation, where it would not *à priori* be expected. Thus, certain animals which, from the structure of their digestive organs, are plainly designed to live entirely either on vegetable or animal food, will subsist, as a matter of necessity, altogether on the particular kind not intended for them by nature, especially when the change is made in a gradual manner. Thus, in the northern parts of Asia, where grain is scarce, horses and oxen are sometimes fed on fish. Spallanzani (*Expériences sur la Digestion*, c. 74 et 75) habituated an eagle to live on bread, and a pigeon on flesh. If fresh water mollusca are put at once into seawater, or seawater mollusca into fresh water, they perish; but, if the change be gradually made, they live very well.†]

It is sometimes suspected, that no animal can derive nutriment from any material not containing a proportion of azote, one of the essential elements of the animal body, and existing in it far more largely than in plants. [This doctrine, however, must be incorrect, if spiders can live on sulphate of zinc (*Thomson's Annals of Philosophy*, vol. xii. p. 494), and the Otomacs eat little else some months in the year, than large quantities of earth. A *sudden* change from a diet of fully azotized substances, like meat, bread, &c., to one composed of vegetables containing little or no azote, certainly cannot always be borne by the human constitution with impunity. This was proved in the eastern part of France, in the year 1817, where the failure of the crops produced such a famine, that the poor were compelled to contend, as it were, with the beasts of the field, for whatever vegetable productions could be found. The consequences were general anasarca, interruption of the menses, a diminution of the ordinary number of conceptions by one half, as carefully estimated by parochial documents, and permanent injury of the health. Even the sudden return to the use of barley bread, after the continuance of this miserable regimen for three months, was found not to be unattended with peril.]—(*Gaspard, in Magendie's Jour.*, t. i. p. 237, &c.)

It has often been a question, whether the abundance of azote in animals is derived from the atmosphere, by respiration or absorption, or by both these processes; or whether it is produced by the action of life itself; or obtained from articles of food.

The experiments of M. Magendie favour the supposition, that the great source of azote in the animal body is the food; for, on feeding animals of various kinds on substances that contain no sensible portion of azote, as sugar, gum, olive-oil, and butter, together with distilled water, and confining them to this kind of diet, they gradually fell into a state of atrophy, and died. The secretions assumed the character of those of herbivorous animals, the food was digested, but the muscles were reduced to one sixth of their proper volume. It is singular, that all the animals before death exhibited an ulcer of the cornea, which sometimes spread through the membrane, and let out the humours of the eye.

[Haller observes that certain animals are destroyed by the use of sugar, although nutritious and salutary to others. In Stark's experiments, we have many examples of the indigestible nature of a diet composed of a single article, which was easily digested when mixed with other substances. In order to render M. Magendie's experiments unexceptionable, Dr. Bostock (*Physiology*, vol. ii. p. 467) thinks, that a diet should have been tried, composed of a mixture of substances destitute of nitrogen. In fact, M. Magendie himself admits, that the question is not yet settled, whether life can be long supported by the sole use of any one species of aliment, however nutritive.—(*Physiology*, p. 222, 2d edit.) At the same time, it deserves particular notice that, in 1750, a caravan of above one thousand Abyssinians, in consequence of having

* The diversified character of the aliment of man might be farther illustrated by the great variety of food used by certain tribes of the North American Indians, particularly those inhabiting the western regions on the borders of the Pacific Ocean.—D.

† Ann. de Chimie, &c. vol. ii. p. 32, and Blumenbach's Physiology, 4th edit. p. 309 Sometimes a long deviation from the natural food is followed by a change in the structure of the digestive organs: thus, after a seagull has lived for some time upon grain, the strength of its gizzard is increased. See Home, Comp. Anat., vol. i. p. 354.

consumed all their provisions, are alleged to have subsisted for two months entirely on gum-arabic, which happened to be among their merchandise.—(*Hasselquist, Voyages, &c. in the Levant*, p. 298.) If this be true, it proves that man can live on a single substance, which was found by Magendie to be insufficient nourishment even for dogs.]

In general, the length of the alimentary canal is greater in mammalia than in the subordinate classes. It diminishes successively in birds, amphibia, and fishes; being in some fishes even shorter than the body itself, which is never the case in the first three classes; and in insects and worms is so diversified, as almost to bid defiance to any kind of scientific arrangement; being, in many instances, short and narrow, as in the dragonfly (*libellula*); and in others, as proper hydatids and infusory worms, constituting the globular membrane in which the entire structure of the animal consists. [On the whole, a long and complicated intestinal tube denotes that the insect feeds on vegetables; while the contrary character indicates that its food is animal. So capricious has nature been in the lower beings that, in the animals of corals and sponges, the intestines of several individuals frequently communicate (*e. g.* in the animals of the *pennatula*, sea-feather), where the nutriment of all is derived from a common source.]—(*Carus's Comp. Anat.*, vol. i. p. 14.)

Attached to the cheeks in some quadrupeds, as the monkey and marmot tribes, is a pouch or pocket, which conveniently holds their spare food, or enables them to convey it to their winter hoards.

The mouth communicates with the stomach by the long, narrow, membranous, and muscular canal, denominated the œsophagus, or gullet. This in many animals is so dilatable, as to enable them to swallow animals more bulky than themselves. [In those carnivorous animals which swallow voraciously, as the wolf, it is very large; but in many herbivorous ones, of considerable size, and particularly such as ruminate, its muscular fibres are proportionably stronger, and capable of voluntary motion. The process of rumination implies a power of voluntary motion in the œsophagus; and indeed the influence of the will throughout the whole operation is incontestible. It is not confined to any particular time; since the animal can delay it, according to circumstances, when the paunch is quite full. In the occasional examples of the power of rumination in man, the operation is also found to be voluntary. The opening of the œsophagus into the stomach is marked by some differences, both with regard to its size and mode of termination: circumstances explaining why some animals, as the dog, easily vomit; while others, as the horse, are scarcely susceptible of this operation,* which, in the latter, is also partly hindered from taking place through the mouth, by the complete manner in which this cavity can be separated from the gullet by the velum palati.]

We have not time to follow up these playful diversities of nature; and must confine ourselves to a brief glance at the general structure of the human stomach, to which the œsophagus conducts. This is situated on the left side of the diaphragm or midriff: in its figure it resembles the pouch of a bagpipe; its left end is most capacious; its upper side is concave, and its lower convex; the two orifices for receiving and discharging the food are situated in the upper part. In its substance it consists of three principal coats or layers, the external and internal of which are membranous, and the middle muscular. The internal coat, moreover, is lined with a villous or downy apparatus, and is extremely convoluted or wrinkled; the wrinkles increasing in size as the diameter of the stomach contracts. [Few parts are more largely supplied with bloodvessels than the stomach, and it not only partakes of the ganglionic nerves with the neighbouring viscera, but it likewise derives another supply of nerves from the spinal cord, and is distinguished from every other part, except the organs of sense, by having a pair of cerebral nerves almost entirely devoted to it, though it is situated at so great a distance from the brain.]—(*Bostock's Physiology*, vol. ii. p. 443.) In an adult it will commonly contain three pints, or rather more; [and, according to Soemmerring, when it is moderately distended, it will hold from five to eleven pints. In opening some carnivorous animals directly after death, a middle muscular constriction is noticed, dividing the organ imperfectly into two compartments. Sir Everard Home deems a similar constriction natural to the human subject, and dwells much upon it in his theory of digestion. Soemmerring occasionally noticed it in females, in whom he supposed it to be caused by the pressure of the central bone of their stays. According to Andral (*Anat. Pathol.* t. ii. p. 133), it is mostly the result of a change of texture, or of a contraction of the muscular coat, and sometimes a congenital imperfection. He conceives, that it indicates in man the first degree of tendency to the kind of division of the stomach distinctly manifested in some other animals. If, however, in him the stomach naturally consists but of a single cavity, without any constriction or partition, a division of that organ is not the less evinced in him by other circumstances. Thus, the structure of the mucous membrane is certainly not exactly alike in the splenic and pyloric portions of the stomach. Their functions are also quite as different, while they are still further distinguished by the relative frequency and even the nature of their alterations of texture. In some animals, the different organization of the two portions of the stomach is manifest to the eye: thus, in the horse, all the inside of the splenic portion is lined by a thick cuticle. The stomach of the negro is rounder and shorter

* Blumenbach's Comp. Anat., pp. 82—87, 2d edit. When a horse is compelled to vomit, he makes such efforts with the abdominal muscles, that the pressure on the distended stomach sometimes bursts it, the rupture always taking place towards its great curvature. Se Andral, Anat. Pathol., t. ii. p. 107.—EDITOR.

than that of the European; and a still more remarkable roundness exists in the stomachs of apes, as is represented in Daubenton's excellent plates.

With respect to the muscular fibres of the human stomach, the question is frequently agitated, whether they have any share or not in rejecting the contents of that viscus in the act of vomiting? M. Chirac gave a dog some corrosive sublimate on a piece of bread, which was almost immediately vomited up, though a violent retching afterward continued. In this state of things, the animal's abdomen was opened, and the peristaltic action of the stomach appeared to be so feeble, that Chirac was led to infer, that the expulsion of its contents could not be owing to it. Even when the experimenter's finger was applied to the stomach, while the retching was going on, it is said, that no contraction of this organ could be felt.—(*Hist. de l'Acad. des Sciences*, 1686.) Duverney also regarded the stomach as entirely passive in the act of vomiting. Mr. Hunter, if he did not go so far as the latter conclusion, certainly refers the chief part of the operation to the action of muscles.—(*Animal Economy*, p. 200, 2d edit.) This doctrine received corroboration from the experiments of M. Magendie. Two grains of tartarized antimony, dissolved in an ounce and a half of water, were introduced into a dog's crural vein. Nausea was quickly excited. The stomach was then made to protrude through a wound in the abdomen; when the spasm of retching was plainly seen to depend upon the action of the diaphragm and abdominal muscles; the stomach itself remained free from contraction, and its contents were not discharged. After the stomach had been returned into its natural situation again, so as to be capable of being acted upon by the above muscles, vomiting took place, and at the same time that viscus was felt with the finger to be relaxed. When the nervi vagi were divided, vomiting was not thereby prevented from being the consequence of the introduction of the tartarized antimony into the venous system; a fact, confirming the result of some experiments made long ago by Dr. Haighton. Neither was vomiting hindered from being produced by this use of tartarized antimony, when the abdominal muscles were removed, provided the linea alba remained entire, between which and the diaphragm the stomach was yet subjected to the necessary compression. When the phrenic nerves were cut, and the diaphragm was left with only a supply of nervous influence from a few filaments of the eleventh and twelfth dorsal nerves, it was so weakened, that it no longer duly antagonized the abdominal muscles, and vomiting could only take place in a feeble way. Perhaps, however, the most curious experiment was that in which M. Magendie removed the stomach, substituted for it a bladder communicating with the œsophagus, and then threw the solution of tartarized antimony into a vein: even under these circumstances retching came on, and the contents of the bladder were vomited up.—(*Mém. sur le Vomissement et Physiol.*, t. ii. p. 138 On the contrary, Lieutaud and Haller looked upon the stomach as the chief agent, and Sir Charles Bell may be set down as on the same side of the question; and he adverts to a stomach in his possession, the coats of which are so thickened, that they could not be made to contract by the action of the muscular fibres, and consequently there was no vomiting.* Against Magendie's experiments, others are recorded by Maingault; as well as a most interesting case of malformation by Drs. Graves and Stokes,† which was attended with such a displacement of the stomach into the chest, that this viscus was entirely above the diaphragm, and beyond the reach of its contractions. Yet incessant vomiting occurred during the patient's illness; "a fact worth a thousand experiments, and which completely decides the question, that vomiting may be produced by the action of the stomach itself, unassisted by any external compressing force." On the whole, however, from the various facts which have been made out on the present topic, and to some of which we shall advert in the chapter on Limosis Emesis, it may be inferred, that, in ordinary vomiting, the contraction of the stomach itself is not essential, any more than the compression of the diaphragm and abdominal muscles under extraordinary circumstances.

Nothing can be more aptly contrived for the purpose of agitating, mixing, and presenting every portion of the alimentary mass to the surface, by which certain parts are to be absorbed, than is the whole structure of the small intestines. While their muscular fibres are calculated to produce a constant undulatory vermicular motion, these are loosely lined by the absorbing membrane, whose numerous plicæ and valves form a most extensive surface, with their villi erected, and even mixed, as it were, with the semifluid alimentary matter. Then the outside of these bowels consists of a smooth and constantly lubricated surface, greatly facilitating the motion of the different convolutions upon each other.]—(*Bright's Lectures, in Medical Gazette, for June*, 1833, p. 282.)

In the more perfect classes of animals, the division between the large and small intestines is distinctly indicated by a muscular valve, formed jointly of the coats of the colon and the ileum by a short natural introsusception of the terminating portion of the latter into the commencing portion of the former; the important

* Anat. of the Human Body, vol. iv. p. 54. When we come to limosis emesis, however, an instance will be mentioned of incessant vomiting, though the coats of the stomach were prodigiously thickened.—Ed.

† Dublin Hospital Reports, vol. v. 8vo., 1830. The mechanism of vomiting is yet a disputed point. Dr. Marshall Hall is led by his experiments to believe, that the contents of the thorax and abdomen are subjected to a sudden and almost spasmodic contraction of all the muscles of expiration, the larynx being closed, so that no air can escape from the chest. Dr. A. T. Thomson inclines to the same view, and considers vomiting as an expiratory effort, rendered abortive by the shut state of the glottis. See his Elem. of Materia Med., &c. vol ii. p. 193. 8vo. Lond., 1833.

use of which is to moderate the flow of the contents of the smaller intestines into the latter, and to prohibit a regurgitation of feces into the former. And hence we never meet with fecal matter in the stomach, except in cases in which this valve or sphincter has lost the whole or a considerable portion of its muscular power. In the hedgehog, and several other quadrupeds, the valve of the colon does not exist; and in a few others, as the sloth and armadillo, the cœcum is wanting. In birds, the rectum, at the termination of its canal, forms an oval or elongated pouch, called *bursa Fabricii*, from the name of its discoverer; and then expands into a cavity, which has been named cloaca, from its receiving the extremities of the ureters and genital organs and their secretions; so that the fluids from all these are discharged from one common emunctory. The same mechanism is extended to a few quadrupeds, as the *ornithorhynchus paradoxus*, and the *hystrix*: the penis of the male, and the horns of the uterus in the female, being equally lodged in its interior.—(*Sir E. Home, in Phil. Trans.*, 1802, pt. 1 and 2.)

Contributory to the function of digestion, performed in the stomach and the parts of the alimentary canal immediately adjoining to it, are several organs which lie near it, and are connected with it in a peculiar manner. Of these the chief are the pancreas, the liver, the spleen, and the omentum. The last two are less constantly found in the animal kingdom than the liver, to which they are by many physiologists supposed to be subservient. They generally become more obscure, or diminish in size, from quadrupeds to fishes: a remark that will equally apply to the pancreas, which upon the whole disappears sooner than the spleen. It is found in the shark and the skate; but, in other fishes, its place seems to be occupied and supplied by the cœcal appendices and pyloric cœca.

The largest and most important of all these organs is the liver, by which the bile is prepared, [and which, besides being supplied, like other parts of the body, with arteries, has a large quantity of venous blood constantly poured into it by the vena portæ, formed by the junction of the veins from many of the abdominal viscera, and ramifying, like an artery, in its substance. Thus, it has two sets of vessels going into it; and it has also two sets issuing from it; one, the vessels forming the hepatic vein; the other, the biliary ducts, uniting together to form the hepatic duct. In addition to all this apparatus, absorbents are distributed abundantly both to the surface and to the substance of the liver, and nerves from the hepatic plexus go to every part of it. Besides all these vessels and nerves, the liver contains a granulated substance, between the different portions of which a cellular tissue is interposed.]—(*Bright, Op. cit.*) It is the seat of a great variety of diseases, and appears to produce a very powerful effect on the blood itself, by the removal of several of its principles, independently of its office as a digestive organ. It descends, under some modification or other, from man to the class of worms; and, in the snail and several other gasteropodous mollusca, is comparatively very large; but, in various kinds, is destitute of a gall-bladder, as well among quadrupeds, as birds, fishes, and worms; though this appendage is common to all the amphibia, many of which, as the salamander, have livers of great magnitude.

All these organs co-operate in digestion, though the peculiar effect produced by several of them is still a subject of inquiry. They present to our observation a variety of curious structures, which we shall notice more at large in treating respectively of their deviations from health; and their surface is covered by a membranous plate, or sheet, supposed by Haller to be of condensed cellular membrane. Bichat has divided the proper membranes of the animal frame into three kinds; serous, mucous, and fibrous. The first forms a common external coating for the viscera, whether substantial or hollow: it is possessed of few nerves, and is lubricated by a perpetually ascending halitus. The second, or mucous membranes, form an internal coating to the larger tubes and hollow viscera, mostly connected with the skin at their extremities, as the mouth, nostrils, œsophagus and intestines, the cavities of the urinary and the uterine systems. They are enriched with numerous nerves, and their structure is loaded with minute glands, which secrete a muculent fluid, with which the interior surface of the organs is constantly moistened. The third, or fibrous division of membranes, belongs to another set of organs, and consists of the dura mater, which lines the scull, the periosteum, the membranous expansions of the muscles, the capsules of the joints, and the sheaths of the tendons.

The solid materials of the food are usually first masticated and moistened in the mouth and fauces, and in this state are introduced into the stomach, where they are converted into a homogeneous pulp or paste, which is called chyme; they are then in this pultaceous form introduced into the duodenum, and, by an additional operation, transmuted into a fluid, often presenting a milky appearance, and denominated chyle; in which state they are absorbed or drunk up by thousands and tens of thousands of little mouths of very minute vessels, which are sparingly if at all found in the stomach, but which abound upon the interior surface of the small intestines into which the stomach empties itself. These vessels constitute a distinct part of the lymphatic system. From the frequently milky appearance of their contents, they are known by the name of lacteals; [but, as the chyle is not always white, perhaps a better name for them is chyliferous vessels.] They anastomose, or unite together gradually, and at length terminate in one or two common trunks, the chief of which is termed the thoracic duct, whose office is to convey the different streams thus collected from the alimentary canal, as well as from other parts of the body, to the sanguiferous system, to be still farther operated upon by the action of the heart and lungs.

[The saliva, or spittle, the fluid with which

the food is first blended in the mouth, is secreted by the salivary glands. According to Berzelius, its solid contents do not exceed seven in 1000 parts, the rest being water. The principal saline ingredient in it appears, from Tiedemann and Gmelin's analysis, to be muriate of potash; but the sulphate, phosphate, acetate, carbonate, and sulphocyanate of potash are likewise present in small quantity. The human saliva contains but little soda. All physiologists, in their account of the uses of the saliva, represent it as lubricating the aliment preparatory to deglutition; as bringing sapid bodies under the influence of the organ of taste; and as softening the food for digestion.

In the above sketch of digestion, the function of the lacteals or chyliferous vessels has been cursorily noticed. It must now be mentioned, that modern physiologists disagree about the extent of the office and power of these vessels. Thus, M. Magendie's experiments lead him to doubt, in opposition to the statements of Hunter, whether they ever absorb any thing but chyle; and it is one of his doctrines, that all other substances, and particularly drinks, are conveyed from the alimentary canal into the circulation by the veins. It is the villi of the intestines, he observes, formed in part by the origins of the veins which absorb all the liquids in the small intestines, except the chyle. From the commencement of absorption until its conclusion, the properties of those liquids are discoverable in the blood of the branches of the vena portæ, but not in the lymph, or chyle, till long after absorption has begun. Magendie's experiments also tend to prove, that they then reach the thoracic duct, not through the chyliferous vessels, but by the communication of the arteries with the lymphatics. The vena portæ, which is the trunk of all the veins of the digestive organs, divides and subdivides in the tissue of the liver. Now, certain other experiments, of which M. Magendie gives the particulars, induce him to conclude, that this arrangement in the human economy has the effect of mixing the matter, absorbed in the intestinal canal by the veins, intimately with the blood; and that, if large quantities of drink and other substances, not chyle, were to be at once transmitted to the source of the circulation by the thoracic duct, without having undergone a preliminary change in the liver, serious and fatal consequences would arise. The facts on which this reasoning is founded, are highly interesting.*

Sir Everard Home formerly entertained a particular theory, that fluids passed from the stomach directly into the spleen. Though his observations disagree very much with those of Magendie, they corroborate one point maintained by the latter physiologist, namely, that fluids pass from the alimentary canal into the circulation by some other channel than that of the chyliferous vessels. Strong arguments against Sir Everard Home's particular theory are deducible from the fact, that, if it were true, animals certainly could not exist, or even enjoy good health, without a spleen. Sometimes the spleen is wanting in man (*Lieutaud*, tom. i., p. 234); and sometimes it has been removed from animals, which recovered and lived very well.—(*Th. Bartholini, Anatomy*, p. 155. *Mayo's Outlines of Physiology*, p. 142.) The hypothesis also appears to be scarcely consistent with what happens in the horse, whose stomach, which is small in proportion to the size of the animal, could not contain the immense quantity of hay, grass, oats, and water, often consumed in a very short time; and from which organ, Professor Coleman has ascertained by experiments, that the passage of drink along the intestines is sometimes equal to the rate of ten feet in a minute.]

The means by which the food is broken down into pulp, after being received into the stomach, are various. In the first place, the muscular tunic of the stomach acts upon it by a slight contraction of its fibres; and, in connexion with a certain degree of pressure, derived from the surrounding organs, produces, so far as this cause operates, a mechanical resolution. Secondly, the high temperature in the stomach produces a concoctive resolution. And, thirdly, the stomach itself secretes and pours forth from the mouths of its minute arteries a very powerful solvent, which is by far the chief agent in the process, and thus effects a chymical resolution. In this manner, the moistened and masticated food is converted into chyme. It then passes into the duodenum, and becomes mixed with the secretions poured into this organ from the pancreas, the liver, and the duodenum itself, and subject to their action; and hence its conversion into chyle.

The whole process of digestion, therefore, as it occurs in the human body, to which the description now given chiefly applies, consists of three acts; mastication, or chewing, chymification, and chylification.

Many substances are so hard and intractable as to sustain the action of the digestive organs without any other change, than that of being softened or otherwise partially affected, instead of being entirely subacted, and reduced to chyme or chyle. Such especially are the seeds of plants: and it is well worth observing, that, while birds or other animals derive from this kind of food a valuable nutriment, notwithstanding its passing through them without being completely digested, the seeds themselves, that are thus acted upon, derive also a reciprocal benefit in many instances; and are hereby rendered more easily capable of expanding in the soil into which they are afterward thrown as by accident, and have their productive power

* The views of Haller, Hunter, Musgrave, and others, in regard to the absorption of foreign substances by the lacteals, are confirmed by the experiments of McNeven and Ducachet. "In the presence of Dr. Francis," says Dr. Ducachet, "I gave a cat about half a pint of milk deeply tinged with indigo. In half an hour I killed the animal, and upon dissection found the *lacteals* containing a fluid of a deep blue colour."—New-York Med. and Phys. Journal, vol. i., p. 132.—D.

very greatly increased.* The olive-tree has till of late years only been raised in the south of France by cuttings, or wild plants obtained from the woods. It was remarked by an attentive inhabitant of Marseilles that, when produced naturally, it is by means of kernels carried into the woods, and sown there by birds which had swallowed the olives. By the act of digestion, he further observed, these olives are deprived of their natural oil, and the kernels hence become permeable to the moisture of the earth; the dung of the bird at the same time serving for manure, and perhaps the soda which the dung contains, by combining with a portion of the oil that has escaped digestion, still further favouring germination. Following up this fact, a number of turkeys were made by the experimenter to swallow ripe olives; the dung was collected, containing the swallowed kernels; the whole was placed in a stratum of earth, and frequently watered. The kernels thus treated vegetated easily, and a number of young plants were procured. And in order to produce upon olives an effect similar to that experienced from the digestive power of the stomach, a quantity of them were afterward macerated in an alkaline lixivium; they were then sown, and proved highly productive.

Most of the plants found on coral islands, and in various other places, are propagated by the same means of passing through the digestive canal; and it is probable that the seeds of many of them are equally assisted by the same process. And even when they are completely disorganized and digested, the material to which their refuse is converted, and which, combined with the animal secretions that accompany it, is called dung, very powerfully contributes, as every one knows, to render the soil productive. So that, by the wisdom of Providence, animal digestion and vegetable fructification are equally dependant on each other, and are alternately causes and effects.

Considering the comparatively slender texture of the chief digesting organ, and the toughness and solidity of the substances it overcomes, it cannot appear surprising that mankind should, at different times, have run into a variety of mistaken theories in accounting for its mode of action. Empedocles and Hippocrates supposed the food to become softened by a kind of putrefaction. Galen, whose doctrine descended to recent times, and was zealously supported by Grew and Santarelli, ascribed the effect to concoction, produced, like the ripening and softening of fruits beneath a summer sun, by the high temperature of the stomach. Pringle and Macbride advocated the doctrine of fermentation; thus uniting the two causes of heat and putrefaction assigned by the Greek writers: while Borelli, Keil, and Pitcairn, resolved the entire process into mechanical action, or trituration; thus making the muscular coating of the stomach an enormous millstone, which Dr. Pitcairn was extravagant enough to conceive ground down the food with a pressure equal to a weight of not less than a hundred and seventeen thousand pounds, assisted at the same time in its gigantic labour by an equal pressure derived from the surrounding muscles.

Each of these hypotheses, however, being encumbered with insuperable objections, Boërhaave endeavoured to give them force by interunion, and hence united the mechanical theory of pressure with the chymical theory of concoction; while Haller contended for the process of maceration. Still a something else was wanting, and continued to be so, till Cheselden, in a lucky hour, threw out the hint (for at first it was nothing more than a hint) of a menstruum secreted in some part of the digestive system; a hint which was soon eagerly laid hold of, and successfully followed up, by Haller, Reaumur, Spallanzani, and other celebrated physiologists. Although Cheselden was mistaken in the peculiar fluid to which he ascribed the solvent energy, namely, the saliva, still he led forward to the important fact; and the gastric juice was soon afterward clearly detected, and its power incontrovertibly established.

[The doctrine of digestion by trituration, or mechanical principles, was founded in a great measure upon an imperfect acquaintance with the digestive organs of birds. Although birds are not furnished with teeth, many of them feed upon hard substances, which, if they were unbroken, the gastric juice could not dissolve. Hence they are furnished with a crop, which is a large membranous cavity at the lower end of the gullet, for the reception of the food when it is first swallowed, and where it is softened by the secreted fluids of the part. They are also provided with a gizzard, into which the food, after being macerated in the crop, is transmitted. The gizzard is a cavity of a moderate size, and flattish, spherical form, composed of four strong muscles. Two of these, which constitute the greatest part of its bulk, are of a hemispherical shape, of a dense and firm texture, and lined with a thick callous membrane. The effect of their action is, to move them laterally and obliquely upon each other, so that whatever is placed between them is subjected to a very powerful combination of friction and pressure. The force is such, indeed, as not only to break down the hardest grains and reduce them to a complete pulp, but even to grind to powder pieces of glass, and to act upon silicious pebbles and masses of metal; while the cuticular lining is so tough as not to be injured by the presence of lancets or other sharp instruments, which have been introduced into the cavity by accident, or for the sake of experiment. However, the action, both of the crop and the gizzard, must be considered as essentially mechanical, the latter being equivalent to the teeth, and the

* In many birds, the pylorus is close to the orifice of the stomach, and has no valve, so that the seeds of plants which have been swallowed readily pass into the intestinal canal. This arrangement must have an important effect in promoting their diffusion. Their disposition to vegetate more quickly after having thus pervaded the alimentary tube, is a fact that was particularly noticed by the late Sir Joseph Banks.—Ed.

former serving merely for the purpose of maceration. A strict connexion is always remarked between the food of birds and the nature of their stomachs; those alone possessing the gizzard which swallow substances that the gastric juice could not dissolve in the entire state. Many writers, in describing the muscular stomachs of granivorous birds, speak of the gizzard as analogous to the digesting stomach of man or of non-ruminant quadrupeds, whereas it is only a substitute for the organs of mastication.* Spallanzani proved, however, that the triturated substance in the gizzard is acted upon by the gastric juice, which is furnished by a glandular apparatus,—the bulbus glandulosus, situated at the lower end of the gullet; the structure of the gizzard being evidently not adapted to its secretion. In birds, therefore, digestion is produced by a powerful solvent, just as it is in the human subject.]

The gastric juice, this wonderful menstruum, the most active we are acquainted with in nature, is secreted, as I have already observed, by the capillary arteries that infinitesimally intersect the cellular texture of the stomach, and decussate each other in their ramifications. The quantity secreted during digestion is considerable: Leuret and Lassaigne found that when the gullet of a horse was tied, so as to prevent the secretions of the mouth and gullet from entering the stomach, a full meal of oats became completely saturated with gastric juice in four or five hours. Mr. Cruickshank supposes the quantity of the fluid thus secreted to be about a pound in every twenty-four hours. Yet the quantity seems to vary considerably, according to the demand of the system, or the state of the stomach itself. In carnivorous birds, whose stomachs are called membranous from having little muscularity, and, consequently, whose food is turned into chyme principally by the action of the gastric juice, without any collateral assistance or previous mastication, this fluid is secreted in a much larger abundance; as it is also in those who labour under that morbid state of the stomach which is called canine appetite, and will be distinguished in the present classification by the name of *limosis avens*; as likewise when, on recovery from a fever, or after long abstinence, the system is reduced to a state of great exhaustion, and a keen sense of hunger induces a desire to devour food voraciously and almost perpetually.

[If the contents of the stomach be examined after a long fast, and without any stimulus being applied to its villous membrane, the fluid found in it is a clear, ropy, rather opaque liquid, nearly or quite destitute of acidity. But if any stimulus, even of the simplest kind, be applied to the inside of the stomach, then the fluid secreted is uniformly acid. Hence, during digestion, it is found to be distinctly acid; indeed, free muriatic acid was detected during this process by Dr. Prout in the stomach of the rabbit, hare, horse, calf, and dog (*Phil. Trans.*, 1824); and also in the matter ejected from the stomach of persons labouring under indigestion. Tiedemann and Gmelin obtained the purest gastric juice by making animals swallow quartz pebbles after a long fast, and killing them an hour afterward. It was generally grayish-white, ropy, and decidedly acid. When taken from the dog and the horse, it contained some mucous, osmazome, and salivary matter, alkaline sulphates and hydrochlorates, the alkali being chiefly soda, besides phosphate and muriate of lime, with other salts in minute proportion; and the acidity was owing to the hydrochloric and acetic acids in the dog, and to these conjoined with the butyric acid in the horse. As the lactic acid of Leuret and Lassaigne is now acknowledged by Berzelius to be a variety of the acetic, all parties may be regarded as agreeing about the presence of that acid in the gastric juice. The researches of Prout, Children, and Graves, confirmed as they have been so amply by Tiedemann and Gmelin, also fully establish the presence of free muriatic acid. When the secretion of the gastric juice is elicited by its natural stimulus, food of various kinds, the chymous mass is invariably acid; and Tiedemann and Gmelin further maintain, as the result of their experiments, that its acidity is greatest when the food is most difficult of digestion. In dogs and cats, the greatest acidity was remarked when they were fed with coagulated albumen, fibrin, bones, or gristle; it was less when they took starch, gelatin, potatoes, or rice; and when they were fed with liquid albumen, the alkaline quality of the food was nearly sufficient to neutralize the acidity of the gastric juice.]

This singular secretion has the peculiar property of coagulating milk, as well as all albuminous substances, which it also as completely dissolves; and hence the milk thrown up from the stomach of an infant, shortly after it has been swallowed, is always found in a curdled state. [By infusing six or seven grains of the inner coat of the stomach in water, a liquor is produced, which, according to Dr. Fordyce, will coagulate 100 ounces of milk; or, according to Dr. Young of Edinburgh, 6857 times its weight of milk.] But the two grand and characteristic properties of the gastric juice are, its astonishing power of counteracting and correcting putrefaction, and of dissolving the toughest and most rigid substances in nature.

Of its antiseptic power, abundant proofs may be adduced from every class of animals. Among mankind, and especially in civilized life, the food is usually eaten in a state of sweetness and freshness; but fashion and the luxurious desire of having it subacted and mellowed to our hands, tempt us to keep several kinds, as game and venison for example, as long as we can endure the smell. The wandering hordes of gipsies, however, and the inhabitants of various savage countries, and especially those about the mouth of the Orange river in Africa, carry this sort of luxury to a much higher pitch; for they seem to regard a fetor as a perfume,

* In fact, in that kind of grasshopper termed *acrida aptera*, the heart-shaped gizzard has six longitudinal rows of large teeth, and six intermediate double rows of smaller teeth, making in all 270 teeth.—D.

and value their food in proportion as it approaches putrefaction.

Now, all these foods, whatever be the degree of their putridity, are equally restored to a state of sweetness by the action of the gastric juice, a short time after they have been introduced into the stomach. Dr. Fordyce made a variety of experiments in reference to this subject upon the dog, and found in every instance, that the most putrid meat it could be made to swallow was in a very short period deprived of its putrescency. We cannot, therefore, be surprised that crows, vultures, and hyenas, which find a pleasure in tainted flesh, should fatten upon so impure a diet; nor that the dunghill should have its courtiers, among insects, as well as the flower-garden.

The gastric juice has hence been employed as an antiseptic in a variety of cases out of the body. Spallanzani ascertained that the gastric juice of the crow and the dog will preserve veal and mutton perfectly sweet, and without loss of weight, thirty-seven days in winter; while the same meats, immersed in water, emit a fetid smell as early as the seventh day, and by the thirtieth are resolved into a state of most offensive putridity.

Physicians and surgeons have, in like manner, availed themselves of this corrective quality; and occasionally employed the gastric juice of various animals internally, in cases of indigestion from a debilitated stomach; and externally, as a check to gangrene, and a stimulus to indolent ulcers.

Yet, the gastric juice is as remarkable for its solvent, as for its antiputrescent property. Of this any industrious observer may satisfy himself by attending to the economy of digestion in many of our most common animals. But it has been strikingly exemplified in the experiments of Reaumur, Spallanzani, and Stevens.* Pieces of the toughest meats, and of the hardest bones, enclosed in small perforated tin cases, to guard against all muscular action, were repeatedly, by the two former of these physiologists, thrust into the stomach of a buzzard. The meats were uniformly found diminished to three fourths of their bulk in the space of twenty-four hours, and reduced to slender threads; and the bones were wholly digested either upon the first trial, or a few repetitions of it. The gastric juice of a dog dissolves ivory and the enamel of the teeth; that of a hen has been found to dissolve an onyx, and diminish a louis-d'or. And it is not many years ago, that the handles of several claspknives were found half-digested, and the blades blunted, in the stomach and intestines of a man, who had some time before swallowed these substances out of hardihood, and at last died in one of the hospitals of this metropolis. [The experiments of Leuret, Lassaigne, Tiedemann, and Gmelin, all confirm the statements of Spallanzani, Stevens, Gosse, and others, and contradict those of Montègre, who supposed that the gastric juice did not act out of the body. Leuret and Lassaigne remarked, that the fluid procured by long sponges from the stomach of a duck while fasting, when kept upon bread crumbs, at a temperature of 88 degrees Fahrenheit, soon divided them into minute particles, and formed with them a homogeneous mass, precisely like chyme; and that, when flesh was mixed with the gastric juice of a dog, it was quickly softened and deprived of weight. The observations of Tiedemann and Gmelin are more particular. The fluid found in the stomach of a dog, during the digestion of bones and coagulated albumen, was made the subject of experiment, and comparative observations were made with water and with milk. Various kinds of food were tried, such as bread, coagulated albumen, raw flesh, and boiled flesh; and in every instance it was observed, that the bread was broken down, in the course of eight or ten hours, into a pap, and the surface of the beef and albumen was converted into a pulp, which could be easily scraped off. Montègre is supposed to have failed in procuring similar results, because the fluid with which he operated, was not gastric juice, secreted in consequence of the application of some stimulus to the stomach, but a mixture of saliva, the mucus of the gullet, and the kind of fluid found by Tiedemann and Gmelin in the stomach while empty and not stimulated. Yet Leuret and Lassaigne, it is to be observed, succeeded with the gastric juice of a duck, though the animal was in the fasting state. A convincing proof of the power of the gastric juice to dissolve substances out of the body, as well as of its great antiseptic property, has lately been put upon record. A lad had a fistulous opening leading into the stomach, from which the gastric juice was readily procured, by means of a hollow bougie and elastic bottle. A piece of beef, connected with a thread, was introduced into the stomach, and another piece was put into a vial of gastric juice, the temperature of which was 100°, the same as that within the stomach itself. The piece in the vial underwent a perfect dissolution, though more slowly than that in the stomach, probably in consequence of the latter being continually exposed to fresh gastric juice, and the peristaltic action of the stomach. Solutions of beef and chicken thus procured, remained a whole month in hot weather, free from fetor and sourness."—(*American Medical Recorder*, January, 1826.) Tiedemann and Gmelin even attempted

* For Dr. Stevens's experiments, which were numerous and well conducted, see his Dissertatio Physiologica Inauguralis; or an analysis of it in Edin. Med. Comment., vol. v. p. 146.

* The experiments here alluded to have recently been published in detail by Dr. Beaumont, who, in his curious and instructive work entitled "*Experiments and Observations on the Gastric Juice and the Physiology of Digestion*," has added much valuable information to this portion of physiology. Alexis St. Martin, the subject of experiment, was accidentally wounded in the side by the discharge of a musket, which removed the integuments and muscles of the size of a man's hand. On recovering, a perforation about two and a half inches in

to accomplish, by means of the simple substances contained in the gastric juice, the same solution or digestion that is effected by this secretion itself; and they found that dilute acetic acid, dilute hydrochloric acid, a weak solution of acetate of ammonia, will severally dissolve most animal substances used as food. The experiments, however, were incomplete, because the effect of the foregoing articles, united together as they are in the gastric juice, was not tried.]

It is in consequence of this wonderful power that the stomach is sometimes found in the extraordinary action of digesting its own self; and of exhibiting, when examined in dissection, various erosions in different parts of it, and especially about its great extremity. It was the opinion of Mr. Hunter (*Phil. Trans.* 1772, vol. lxii. p. 447), however, that such a fact can never take place except in cases of sudden death, when the stomach is in full health, and the gastric secretion, now just poured forth, is surrounded by a dead organ. For he argues plausibly, that the moment the stomach begins to be diseased, it ceases to secrete this fluid, at least in a state of perfect activity; and that so long as it is itself alive, it is capable, by its living principle, of counteracting the effect of this solvent power. Yet it has been found thus eroded, in some cases, where death has followed long constitutional illness. Dr. Wilson Philip has occasionally found similar erosions in the stomachs of rabbits (*Treatise on Indigestion*, &c., p. 62. 8vo. Lond, 1824), and apparently from the cause suspected by Mr. Hunter.*

circumference still existed in the stomach. Dr. B. was thus enabled to observe its inner surface, to remove its contents and secretions, to introduce and withdraw at pleasure any articles of food, and to study their changes. The following are some of his conclusions: The inner coat of the stomach is of a pale pink colour, varying in its hues, according as the stomach is full or empty. It has a velvet-like appearance, and in health is always covered with a thin transparent mucus, which differs physically and chymically from the gastric juice. The gastric juice is limpid, colourless, and slightly viscid. It is secreted by vessels distinct from the mucous follicles, and it is never found free in the stomach, unless excited to discharge itself by food or other stimulants. It acts as a solvent of the food, and its action is assisted by the warmth and by the transverse and longitudinal motions of the stomach. It contains, according to the analyses of Professors Silliman, Dunglison, and Emmet, free muriatic acid and some other active chymical principles. By introducing thermometers into the stomach, its natural temperature was found to be 100° Fahrenheit: the temperature was elevated by exercise and depressed by rest.

In the New-York Medical Repository, vol. xii., Dr. Waterhouse has made known the particulars of a case of fistulous opening of the stomach, occurring in a German female who had borne several children; the phenomena marking the action of the gastric juice and the process of digestion, were in many respects similar to those noticed by Dr. Beaumont; and when Dr. Beaumont's communication was read to the French Academy, M. Roux stated that a similar case had occurred in Paris, and that the patient's death was evidently hastened by the experiments tried on her. Professor Jackson, of Philadelphia, however, denies the existence of the gastric juice, and says (Principles of Medicine, p. 348), "the presumed gastric juice is then no other than the salivary, buccal, pharyngeal, œsophagial, and stomachical follicular secretions and exhalations, collected in the stomach."—D.

* On this very curious subject, Andral has not yet made up his mind, and deems further observations necessary.—(Anat. Pathol. t. ii. p. 28.) The late Dr. Armstrong also entertained some doubt respecting the correctness of Mr. Hunter's doctrine. "If," says he, "the operation of the gastric juice after death, were the cause of the dissolution of parts of the stomach, this appearance would surely be one of the most frequent in morbid anatomy; whereas it is notoriously very rare." He adds, that, in every instance that he had seen, the most unequivocal signs of disease existed for some time before death.—(Morbid. Anat. of the Bowels, p. 46. 4to. Lond., 1828.) On the contrary, Mr. Hunter asserts, that there are few dead bodies, in which the great end of the stomach is not in some degree digested.—(Phil. Trans., vol. lxii.) The examples seen by Dr. Armstrong himself were perforations of the stomach during life. Instead of most frequently occurring in the great, they happened principally in the pyloric extremity of that organ; they were also generally the result of disease, indicated before death by a train of violent and rapidly fatal symptoms. The cases alluded to by Mr. Hunter are totally different, being attended during life with no symptoms of disease of the stomach, and often occurring in persons who have been suddenly killed in the midst of perfect health. In order to explain why digestion of the stomach does not take place in all animals that are killed while in full health, Adams referred to the opinions of Hunter concerning real and apparent death; and was led to conclude, that the digestion only took place when life was so completely and suddenly annihilated, that the blood remained fluid, and the limbs free from stiffness. The facts adverted to by Dr. Carswell, however, sufficiently refute this explanation. Certainly one of the most striking circumstances, in relation to the perforations of the stomach which happen after death, is their usual seat in the great extremity of that organ. It is in this part that fluids accumulate after death by the influence of their own gravity. Mr. Hunter also pointed out another important consideration, which is, that alterations, resembling those of the stomach, are frequently met with in other viscera, to which the contents of that organ directly extend their effects, after its own partial digestion; as the liver, diaphragm, spleen, left lung, and intestines. As my friend Dr. Carswell observes, another equally remarkable fact, is the extension of these alterations in a direction in which a fluid alone could act or be carried, together with the total absence of all redness or other sign of inflammation or adhesion, the formation of pus, &c.—(See Edinb. Med. and Surgical Journ., October, 1830.) This paper contains an account of various interesting experiments, and an examination of all the opinions hitherto delivered on the cause of dissolutions of the stomach met with in the dead subject. The observations of Adams, A. Burns, Spallanzani, Bretonneau (Archiv. de Méd. t. xii. p. 345), Carlisle, A. Cooper, and Carswell, fully establish the truth of Hunter's views. As Dr. Carswell has set down acidity of the gastric juice as essential to the production of the effects here treated of, it might be proper, in a repetition of his experiments, to substantiate this remark, by trying whether the

Is it upon the principle laid down by Mr. Hunter, that, when the stomach is in a state of disease, it ceases to secrete a gastric juice of full vigour and activity, that we can account for the existence of exotic worms and the larvæ of insects and other animals for a considerable period of time without destruction? Thus Collini gives an example of a *lacerta aquatica*, found alive in the stomach two days after it had ben swallowed.—(*Journ. de Méd.*, tom. li. p. 460.) Frogs and serpents have, for a longer period of time, been equally able to resist the action of the stomach; leeches, swallowed unintentionally in a draught of muddy water, have thriven and grown to an enormous size; the eggs and larvæ of various insects, and especially of the *musca cibaria*, and even of the spider, have been hatched or perfected in the stomach or intestines, and the kernels of plum and cherry-stones have germinated there.

Muscular action, however, to a certain extent, seems still requisite as an auxiliary in man, and even considerably more so in many animals, especially in graminivorous and granivorous birds.* I have already stated this as one cause of digestion: but M. Magendie has endeavoured to restore it to a much higher importance than fair and unequivocal experiments justify; for he asserts that, what he calls *artificial digestion*, or that of alimentary substances mixed with the gastric juice, and exposed to the temperature of the stomach, does not succeed in reducing the food to chyme. But this, admitting the fact, would only show us the use of a living principle, and its influence upon every organ, and the operation or function of every organ; and which cannot be imitated out of the body. The assertion, however, is only advanced upon the single authority of M. Montègre, [the failure of whose experiments, as we have already noticed, is imputed by others to the fact, that the fluid with which he operated was not gastric juice, secreted in consequence of the application of some stimulus to the stomach, but a mixture of saliva with the mucus of the gullet, and the fluid found in the stomach while destitute of food, and not stimulated.† In the artificial imitations of the process of digestion, the churning action of the stomach, however, ought certainly to have been taken into consideration, and a substitute for it adopted.

The influence of the par vagum on digestion is an interesting subject, that has excited considerable attention. Mr. Brodie divided these nerves on the cardia, yet the food still continued to be transformed into chyme. M. Magendie took out a portion of a rib, and divided the par vagum on the œsophagus immediately above the diaphragm: still the conversion of the food, both into chyme and chyle, was not interrupted. However, when the same nerves are divided in the neck, and particularly when a portion of them is removed, the formation of chyme is either very imperfect, or even quite prevented. The investigations of Dr. W. Philip, Breschet, and Edwards, prove, that galvanism applied to the stomach, after the division of the par vagum in the neck, restores the digestive process; and hence the doctrine that digestion depends upon galvanic principles. The fact, however, may only prove, that galvanism is a sufficient stimulus to the vessels of the stomach, to enable them to continue for a time the secretion of the gastric juice.

With respect to the power of the nervous system over digestion, a curious fact was demonstrated by the experiments of M. Magendie; namely, that when the brain and a large portion of the cerebellum of a duck is removed, though the instinct of seeking food and even the power of deglutition may be lost, yet, if food be conveyed into the stomach, it will be digested.

If we are to believe some accounts, the cardiac portion of the stomach is the chief seat of digestion; and when a part of the food has there been acted upon in a certain degree, it is conveyed along the large curvature to the pyloric portion, where the process is completed. It seems also now to be established, that the digestive process does not go on equally through the whole mass of the food, but principally where this is in contact with the stomach; that it proceeds gradually from the surface to the centre of the mass, and that, as soon as a portion is reduced to a homogeneous consistence, it is transmitted into the duodenum, without the delay that would result from awaiting a similar change of the whole.*

The food having undergone a sufficient degree of maceration and mastication, or other mechanical process, by which it is reduced to a state of sufficiently minute division, it is acted upon by the gastric juice and the peristaltic contractions of the stomach, and the result is a complete change in its properties, its conversion into chyme; an alteration in every respect analogous to a chymical change. During the process of chymification, heat is occasionally extricated, and not unfrequently gas, composed of carbonic acid, hydrogen, and azote in various proportions, is evolved. Dr. Bostock regards these, however, not as necessary steps in the process, but rather as the consequence of a morbid state of the function.† Previously to Dr. Prout's experiments, the generation of acid in

neutralization of the gastric juice with alkalis, would prevent its action on the stomach. To the living subject they are often given very freely, for the express purpose of improving digestion.—Ed.

* See Sir E. Home's articles, Phil. Trans., vol. xcvi. p. 357; xcvii. pp. 93, 139; c. p. 184; cxiii. p. 77.

† In relation to this point, I may again advert to the case of a healthy young man, who had a fistula in the epigastric region, communicating with the stomach, the consequence of a gunshot wound. Dr. Lovell, of the United States, having collected in a vial a certain quantity of the fluid that escaped from the opening, put a bit of meat into it, which dissolved with great readiness.—See Andral, Anat. Pathol., t. ii., p. 27.—Editor.

* Prout, in Annals of Philos., 1819.

† Physiol., vol. ii., p. 491. Dr. Abercrombie also believes, that, in healthy digestion, no gas is generated in the stomach; but that a certain quantity is evolved in the further progress of the alimentary matters through the intestines, especially in the colon.—See Pathol. and Pract. Researches on Diseases of the Stomach, &c., p. 71., ed. ii., S. C.

the stomach used also to be considered in the same point of view.

Chyme is not always of the same quality, its properties depending much upon the nature of the food. According to recent experiments, made on dogs and horses, it appears that liquid albumen forms under the natural process of digestion a homogeneous fluid, in which the albumen remains quite unaltered; and this sort of chyme passes the pylorus more rapidly than any other. Coagulated albumen is much more slowly dissolved, and the fluid produced possesses the properties of coagulated albumen dissolved in acetic acid. Fibrin and vegetable gluten undergo a similar change. Gelatin is converted into a clear brownish fluid, in which neither gelatin nor albumen can be discovered. White cheese forms an opaque dirty white fluid, containing much animal matter, which, however, is neither the case with gelatin nor albumen. Starch is gradually dissolved, and loses its reaction with iodine, being converted into sugar and amidine. The results obtained with compound articles of food, such as milk, beef, bread, and oats, in various states of mixture, were such as the foregoing facts would lead one to anticipate. Bones gave a liquid that contained not only animal matter, but a large quantity of lime. The general result is, that all the animal principles, except liquid albumen, undergo a material change during chymification, which change generally consists in their being made to approach nearer in their nature to albumen.]

So far, therefore, as the organ of the stomach is concerned in the digestive function, we have some insight into the process. But beyond this, that is to say, of the nature of chylification, we have little or no knowledge that can be depended upon.

The aliment having been reduced to chyme in the stomach, is propelled into the duodenum, where it is converted partly into chyle, which is absorbed into the system from the small intestines, and partly into a residual matter, that assumes the nature of feces in the large intestines, and is ultimately rejected from the system. As it is into the duodenum that the biliary and pancreatic ducts discharge their respective fluids, chylification is generally presumed to be essentially connected with the action of the bile and pancreatic liquor.

[The constancy of the liver, not only in all red-blooded animals, but in the intervertebral with colourless blood, wherever a heart and bloodvessels are present, its magnitude, and the destructive and grievous consequences arising from its diseases, are convincing proofs of its high importance in the animal economy. With these facts, it may seem extraordinary that physiologists should not be in possession of some clear information respecting the functions of this organ, and the uses of the bile. In particular, the action of the latter secretion in chylification is but imperfectly understood. Its ordinary production from venous blood is a peculiarity that does not belong to any other secretion;* while the great difference of its chymical qualities from those of every other fluid in the body, is a point not less remarkable.

One obvious mode of forming a judgment of the uses of the bile, is to remark what ill effects result from the stoppage of its flow into the intestinal canal. On this point, however, the most discordant statements prevail. If we are to credit Dr. G. Fordyce, when the ductus communis choledochus is tied, or blocked up by a calculus, the formation of chyle is not prevented, and consequently the biliary secretion is not essentially necessary for digestion. The same conclusion, with respect to its having no share in the formation of the chyle, is also adopted by some distinguished physiologists of the present time, as will be presently explained. On the other hand, Mr. Brodie, after tying the common biliary duct in young cats, was led to espouse an opinion long ago prevalent, that the principal use of the bile was to separate the chyle from the chyme; for he found, that when that duct was tied, and food given, chymification went on in the stomach as usual; but that no chyle could be detected in the intestines or the lacteals, which only contained a transparent fluid imagined to be lymph, and the watery part of the chyme.—(*See Journal of Science and the Arts*, vol. xiv., p. 343.) The same view is also supported by Mr. Mayo's experiments.

Leuret and Lassaigne tied the common duct in a dog, and cleared out the intestines by giving the animal a little castor-oil. Twelve hours after the operation, they thrice gave it bread and milk with sugar, at intervals of six hours; and eight hours after the last meal it was strangled, and immediately opened. The stomach contained an acid pulp, and a very soft, whitish, sweet chyme adhered to the villous coat of the duodenum, and increased its consistence downwards. In the great intestines it was firm, but had the same colour, and was nearly destitute of taste and smell. The thoracic duct was distended with a yellowish red, transparent fluid, which coagulated on exposure to the air, and yielded the usual proportion of fibrin, albumen, and saline matters.

Tiedemann and Gmelin, whose investigations are more elaborate and precise, remarked, that animals were attacked with vomiting soon after

* In some rare instances, the vena portæ, instead of going to the liver, has terminated directly in the lower vena cava; yet bile was secreted, and, of course, from arterial blood.—(Abernethy in Phil. Trans., vol. lxxxiii., and Lawrence in Med. Chir. Trans., vol. iv., p. 174.) M. Simon found, that tying the hepatic artery in pigeons did not prevent the secretion of bile; but that a ligature on the vena portæ had this effect. On the other hand, Mr. B. Phillips tied this vein in two dogs, and observed that in both instances bile continued to be secreted, though in small quantity. His experiments on the hepatic artery agree with those of M. Simon. The variety in the distribution of the vena portæ affects several hypotheses respecting the use of the liver, and especially that of M. Magendie, which represents all drink as passing through the branches of this vein, and as undergoing some change in the liver, previously to its entrance into the circulation.—EDITOR.

the operation; then with thirst and aversion to food; and that, on the second or third day, the conjunctiva of the eyes became yellow, the stools chalky and very fetid, and the urine yellow, and convertible to blue, and then red, by nitric acid. Some of the animals died; others were killed. Of the latter, some had previously recovered from the jaundice, owing to the re-establishment of the duct by the effusion of lymph around the tied part, and the subsequent discharge of the ligature; a fact also noticed by Mr. Brodie in his experiments. In the cases in which the biliary duct continued impervious, the colouring matter of the bile was found in the blood, the serous membranes, the cellular tissue, the coats of the arteries and veins, and in the fat. It was further observed, that chymification went on as perfectly as in a sound animal. In the small intestines, they found nearly the same principles as in the healthy state, with the exception of those derived from the bile; and, in particular, they found in the duodenum, and in contact with its membrane, the soft mucous flakes which some physiologists consider, though, as Gmelin and Tiedemann think, erroneously, to be chyle. With the exception of the absence of certain biliary principles, the contents of the great intestines were likewise similar to those met with in the bowels of healthy animals; but they had an exceedingly fetid smell. In such animals as had been fed a little while before death, the thoracic duct and the lacteals always contained an abundant fluid, generally of a yellowish colour. It coagulated, like ordinary chyle; the crassamentum acquired the usual red colour; its difference from the chyle of a sound animal was, that after tying the ductus choledochus, it was never white. The reason of the difference is ascribed to the circumstance of the white colour depending upon fatty matter taken up from the food by means of the bile, which possesses the power of dissolving fat, and probably, therefore, aids in effecting its solution in the chyle at the mouths of the lacteals. It is supposed that Mr. Brodie was deceived by the absence of the white colour, which, it is true, the chyle usually possesses, but which, as it is well known, it does not exhibit unless the food contain fatty matter. Mr. B. Phillips also infers, that chyle may be formed independently of the influence of the biliary secretion, and he not only adverts to examples in which the ductus communis had been rendered impervious, by the pressure of tumours, but gives the particulars of experiments made on four dogs, in which he found chyle in the thoracic duct, after the ductus communis had been tied.

The following are the uses ascribed to the bile by Tiedemann and Gmelin; First, by its stimulant properties, it excites the flow of the intestinal fluids, as is proved by the unusual dryness of the feces in jaundiced persons, and in animals, whose common duct has been tied. Secondly, it probably stimulates the intestinal muscular fibres to action. Thirdly, as it contains an abundance of azotized principles, it may contribute to animalize those articles of food which have no azote in their composition. Fourthly, it tends to prevent the putrefaction of the food during its course through the intestines; because, when it is prevented from flowing into them, their contents are much further advanced in decay than in the healthy state. Fifthly, it probably tends to liquefy and render soluble the fatty part of the food. Lastly, it is to be regarded as an important excretion.

According to the researches of the same physiologists, many of the principles of the bile, such as its resin, colouring matter, fatty matter, mucus, and salts, are thrown out of the body, with the feces, in the natural state of the biliary system, or by the urine, or into the cellular tissue, when the excretory duct of the liver is obstructed. These principles contain a large proportion of carbon, and would appear, therefore, to be intended to carry off the excess of that element which is introduced into the system with vegetable food, and not thrown off by the lungs. In the lungs, it is thrown off in the state of oxydation; in the liver, chiefly in union with hydrogen, and in the form of resin and fatty matter. That the liver is thus intended to assist the lungs in decarbonizing the blood, seems to Gmelin and Tiedemann confirmed by the following facts: The resin of the bile abounds most in herbivorous animals, whose food contains a large proportion of carbon and hydrogen. In various tribes of animals, the pulmonary and biliary organs are in a state of antagonism to one another; a fact particularly insisted upon by Fourcroy. The size of the liver and the quantity of the bile are not proportionate to the quantity of the food and frequency of eating; but inversely to the size and perfection of the lungs. Thus, in those warm-blooded animals which have capacious lungs, and live always in air, the liver, compared with the body, is proportionately less than in such as live partly in water. The liver is proportionately larger in reptiles, which have lungs with large cells, incapable of rapidly decarbonizing the blood; also in fishes, which decarbonize the blood but slowly by the gills; and, above all, in molluscous animals, which effect the same change very slowly, either by gills, or small, imperfectly developed lungs. Another thing, pointed out as highly deserving notice, is the increased quantity of blood transmitted through the liver, when the pulmonary system becomes less perfect. In mammalia and birds, the vena portæ is formed by the veins of the stomach, intestines, spleen, and pancreas; in the tortoise, it receives also the veins of the hind legs, pelvis, tail, and vena azygos; in serpents, it receives the right renal, and all the intercostal veins; in fishes, the renal veins, and those of the tail and genital organs

Another observation, made by the same professors, is, that, during the hybernation of certain animals of the class mammalia, when respiration is suspended, and no food is taken, the secretion of bile goes on. An additional argument, in favour of the preceding hypothesis, is deduced from the physiology of the fœtus, in which the liver is proportionately a great deal larger than in the adult, and in which the bile

is secreted abundantly, as appears from the great increase of the meconium during the latter months of pregnancy. Finally, another argument is derived from pathological facts. According to Tiedemann and Gmelin, in pneumonia and phthisis, the secretion of the bile is increased; in diseases of the heart, the liver is enlarged; and, in the morbus cæruleus, the liver retains its fœtal state of disproportion. In hot climates, where, in the opinion of these physiologists, respiration is less perfectly carried on than in cold ones, owing to the greater rarefaction of the air, a vicarious decarbonization of the blood is established by an increased flow of the bile.

The foregoing hypothesis is, perhaps, better supported than that of Sir Everard Home, who considers one of the offices of the bile to be that of converting mucus, or the refuse matter of the chyle, as it passes along the colon, into fat, which is absorbed into the system. This indefatigable physiologist was partly induced to adopt this opinion by the example which he met with of a child, in which the peristaltic action of the bowels had been duly continued, and stools regularly produced, without any intermixture of bile, and even when no gall-bladder, nor any duct leading from the liver into the duodenum, existed.—(*Phil. Trans.*, 1813, art. 21.) The mere circumstance of this child being in a state of marasmus at its death, without any manifest intestinal disease, however, scarcely warrants the theory attempted to be built upon it, and which may be regarded as the reverse of what is inculcated by Fourcroy, Gmelin, and Tiedemann, who represent the bile as depriving the system of its redundant carbon and hydrogen, and not as a means of supplying a larger quantity of these elements to it.

Besides the secretion of the duodenum itself, which is supposed to be concerned in chylification, the pancreatic juice is another fluid apparently intended for the same purpose. The common opinion has been, that, in its nature, it is very similar to saliva: Tiedemann and Gmelin, however, represent it as differing materially from this fluid, and never containing any sulphocyanic acid, free soda, or mucus; as being naturally acid; having a much larger quantity of solid matter; and especially a greater proportion of albumen; and, in the dog at least, a peculiar principle, soluble in water and in alcohol, and, when pure, precipitated rose-red by chlorine. Sometimes, it contains also a good deal of phosphate and acetate of soda. The pancreatic fluid of the dog, horse, and sheep, when heated, yields a large quantity of coagulum, which the saliva does not. The particular use of the pancreatic secretion in digestion is unknown. Tiedemann and Gmelin, reasoning from the large quantity of azotized principles which it contains, presume, that its use may be to animalize vegetable food. They remark, as a confirmation of this opinion, that the pancreas is much larger in herbivorous, than carnivorous animals.—(See *Edin. Med. and Surg. Journ.*, Nos. 91 and 93.)

Of the action of the omentum and spleen, we know nothing certain.* The spleen secretes no peculiar fluid; its blood is of a dark livid colour, and coagulates with difficulty. It is even destitute of an excreting duct; and, in some instances, has been extirpated without injury to the general health. It is not found in any tribes below the class of fishes. [To some of the hypotheses concerning the use of the spleen, reference has already been made. The experiments of Leuret and Lassaigne led them to revive the hypothesis, that the spleen is a mere diverticulum for the blood during digestion. When the stomach and intestines are distended with food, and the process of digestion is going on, the blood flows in an increased quantity to the villous membrane of the whole alimentary canal, and consequently more venous blood requires to be returned by the hepatic vessels. These, however, being presumed to be inadequate to the purpose, the splenic veins and cells become gorged. It was found, that the spleen of the dog, which generally weighs but a few ounces, acquired the weight of a pound and a half two hours and a half after a ligature had been applied to the vena portæ. In the dog, cat, rabbit, Guineapig, and other mammalia, the spleen presented a rosy or vermilion tint while the animals were fasting; after chymification had begun, it assumed a blue colour, and was somewhat tinged; but it did not acquire its deep bluish-black colour, and greatest turgescence, till the chyme had passed the pylorus, when the intestinal membrane participated in the activity previously confined to the stomach. This hypothesis is liable to the objection, that, if true, the absence or removal of the spleen ought always to occasion more serious consequences than it is said to do.

Tiedemann and Gmelin represent the structure of the spleen as essentially resembling that of the lymphatic glands, and regard it as an organ which is merely an appendage to the absorbent system. They believe that its specific function is to secrete from the blood a reddish fluid that has the property of coagulating, is carried to the thoracic duct, and, being there united with the chyle, changes it into blood.

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* Dr. James Rush considers the omentum to be "an organ for the secretion of fat, furnished with vesiculæ for its reception, in order to supply the body with nourishment when the resources by the stomach fail." Among other reasons for this opinion, he mentions its structure, situation, its little sensibility, its presence in most animals, its absence in others; its state in the hybernating animals, &c.—(See Med. and Phil. Reg., vol. vi., No. 1, p. 67.) In regard to the spleen, Dr. Rush says (Med. Museum, vol. iii., p. 10), "All the motions which go forward in the human body, are produced by external and internal stimuli. These stimuli exert their influence directly and indirectly upon the bloodvessels. From innumerable causes they are liable to become *excessive* in their force. The provision to defend the tender and vital parts of the body from the effects of this force, I believe to be the spleen." This theory, which is supported by many ingenious arguments, has recently been revived as new, by Dr. Hodgkin.—See Ed. Med. and Surg. Journ., Jan., 1832.—D.

The facts, elucidated by the experiments of these physiologists, are of great value: yet, their hypothesis, relative to the spleen being an organ of sanguification, is seriously shaken by the facts, that a vast difference really exists between the structure of the spleen and that of an absorbent gland; that the chyle does not invariably exhibit a reddish hue; and that the absence or removal of the spleen may happen, not only without fatal effects, but even without much subsequent disturbance of the animal economy.

Notwithstanding the progress of animal chymistry, and the multiplication of experiments on living animals, we are obliged to confess, that our knowledge of the rationale of chylification is still involved in considerable obscurity. But, though we know not the exact way in which this process is effected, our acquaintance with the properties of the chyle itself is more satisfactory. For the most accurate information concerning the chyle, we are indebted to Dupuytren, Vauquelin, Emmert, Marcet, Prout, Tiedemann, and Gmelin. If the animal, from which the chyle is extracted, has eaten animal or vegetable substances of a fatty nature, the liquid, drawn from the thoracic duct, is of a milky appearance, a little heavier than distilled water, of a strong, spermatic odour, of a salt taste, slightly viscid, and plainly alkaline. It soon separates into three parts: a solid one, that remains at the bottom; a liquid one, at the top; and a third, which forms a very thin layer on the surface. At the same time, the chyle assumes a bright rose colour. When, however, it is derived from food void of fat, it is opaline, and nearly transparent, instead of being of an opaque white colour, and the layer on the surface is less evident. Chyle never takes the hue of colouring substances in the food. M. Hallé proved this by direct experiments. Magendie also made animals eat indigo, saffron, and madder, without the colour of these articles being communicated to the chyle. This fact, which is confirmed by the experiments of Tiedemann and Gmelin in Germany, Andrews at Edinburgh, and Lawrence and Coates in America, is very important, because it is at variance with Mr. Hunter's statement, and upon its correctness the truth of the theory, which restricts the function of the lacteals entirely to the absorption of chyle, and of no other matter, mainly depends. Chyle, derived from sugar, contains hardly any fibrin; while that from flesh has a great deal. The appearances and quality of this fluid are, therefore, considerably modified by the kind of food; and it deserves particular recollection, that, as it is not always white, its pink or transparent look is not to be regarded as a proof, either of the lacteals having imbibed madder, or of the imperfect formation of the chyle.] M. Magendie's experiments led him to conclude, that a dog, upon an average, forms about six ounces of chyle every hour. The subject is highly interesting: but to pursue it further, and especially into that diversity of structure which the digestive organs present in almost all the different classes and orders, adapted, as it is in each of them, with the most skilful attention, to the general economy of their nature, and the mode of life they are destined to lead, would occupy more space than we can spare, and carry us into the regions of general physiology. Enough has perhaps been said, and this is all that has been aimed at, to give a compendious view of the organs which form the seat of that class of idiopathic diseases, with which the nosological system about to be unfolded commences, and consequently to enable the reader to follow up those diseases with greater clearness and comprehension in their distinctive characters and descriptions.*

I have limited the above remark to *idiopathic* diseases; and it is necessary the limitation should be attended to. For, from the intimate connexion which the organs of digestion maintain with other organs and sets of organs, there are few general complaints in which the first do not evince some *sympathetic* affection. This is particularly the case with the stomach, which, in the opinion of Mr. Hunter, is the seat and centre of universal sympathy; a doctrine which appears to have been taught in France by M. de Bourdeu,† though with less caution, and from fewer premises, at the very time Mr. Hunter was teaching it in London.

The sympathetic affections here spoken of, cannot fall within the range of the present class; but must necessarily appertain to those diseases and divisions of diseases, under which they rank as peculiar symptoms, and which can only be removed by removing the idiopathic malady.

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* Dr. Abercrombie sums up, in a few words, the principal circumstances necessary for the healthy condition of the process of digestion: 1. A healthy state of the muscular action of the stomach; 2. A healthy, consecutive, and harmonious action of the muscular coat of the intestinal canal; 3. A healthy state of the fluids of the stomach; 4. A healthy state as to the quantity and quality of other fluids, derived from the liver, pancreas, and mucous membrane of the intestines; 5. A healthy state of the mucous membrane itself, both in the stomach and the intestines.—See *Abercrombie's Pathol. and Pract. Researches on Diseases of the Stomach*, &c., p. 71, ed. 2. S. C.

† See his Thesis, "An Omnes Corporis Partes Digestioni opitulantur?" Paris, 1754.

CLASS I.

CŒLIACA.

ORDER I.

ENTERICA.

DISEASES AFFECTING THE ALIMENTARY CANAL.

DISQUIET OR DISEASED ACTION IN SOME PART OF THE PASSAGE FOR THE RECEPTION AND DETRITION OF FOOD.

THE diseases of the DIGESTIVE FUNCTION form the first class in the Nosological System about to be unfolded; and to these, from the Greek term ΚΟΙΛΙ'Α, "alvus," "venter," or "the lower belly," I have applied the classic name of CŒLIACA.

By an easy and natural arrangement, this class is divisible into two orders; the first embracing those disorders which affect the alimentary canal; and the second, those which affect the collatitious or auxiliary viscera. The former I have distinguished by the term ENTERICA, and the latter by the term SPLANCHNICA, both of which are Greek adjectives; the one being a derivation from ἔντερον, "intestinum," "alvus;" and the other from σπλάγχνον, "viscus," "a bowel, or entrail."

The present order embraces the following genera:—

I.	Odontia.	Misdentition.
II.	Ptyalismus.	Ptyalism.
III.	Dysphagia.	Dysphagia.
IV.	Dipsosis.	Morbid Thirst.
V.	Limosis.	Morbid Appetite.
VI.	Colica.	Colic.
VII.	Coprostasis.	Costiveness.
VIII.	Diarrhœa.	Looseness.
IX.	Cholera.	Cholera.
X.	Enterolithus.	Intestinal Concretions.
XI.	Helminthia.	Worms.
XII.	Proctica.	Proctica.

GENUS I.

ODONTIA.

MISDENTITION.

PAIN, OR DERANGEMENT OF THE TEETH, OR THEIR INVOLUCRES.

THIS genus has by some writers been called odontalgia and odaxismus. But as both these terms have been limited by other writers to a single species of the genus, that of odontia *dolorosa*, or toothache, in order to prevent confusion, I have ventured to give it the name under which it now appears; derived from ὀδούς, "a tooth," which in fact is the common root of all the terms, and is here preserved in its simplest form.

The involucres of the teeth are their gums, membranes, and sockets, or alveoli. The last, although an immediate apophysis of the jaw-bones, are rather to be regarded as an appertenance of the teeth, than of the bones from which they issue. They are altogether limited to the duration of the teeth, sprouting forth at their commencement, and being carried away by absorption, on their decay or removal. They are also in every instance modelled by the shape of the teeth; and, like the gums, participate in almost all their diseases.

The character of the present genus is therefore made sufficiently general to embrace the disorders of these adjuncts of the teeth, as well as of the teeth themselves; all which, as distinct species, may be conveniently arranged in the following order:—

1.	Odontia Dentitionis.	Teething.
2.	——— Dolorosa.	Toothache.
3.	——— Stuporis.	Tooth-edge.
4.	——— Deformis.	Deformity of the Teeth.
5.	——— Edentula.	Toothlessaness.
6.	——— Incrustans.	Tartar of the Teeth.
7.	——— Excrescens.	Excrescent Gums.

SPECIES I

ODONTIA DENTITIONIS.

TEETHING.

IRRITATION FROM CUTTING THE TEETH.

DR. CULLEN did not allow dentition to enter into the list of diseases; but this is to suppose the process of teething to take place at all times, instead of only occasionally, with perfect ease, and without irritation of any kind. Whenever it occurs in this manner, there is undoubtedly no disease, and so far Dr. Cullen is correct. But in a very large number of cases, perhaps, in refined and intenerated society, in the larger number, there is not only disease, but in many instances disease of an alarming and fatal character, strikingly severe in its progress and complicated in its symptoms. The organism of the *teeth*, indeed, is peculiarly distinguished by the following feature: that there is no other part of the human structure so brief in its duration, and none, with the exception of the uterus, so signalized by pain and inconvenience during its progress. Yet their mechanism, notwithstanding these evils, is most admirable. No effort of human wit has ever been able to improve upon it, even in imagination, and no organ is more strikingly impressed with marks of supernal goodness and intelligence. [The human teeth differ from those of animals, in being all of one length, and having no considerable interspaces between them. Another of their peculiarities is the perpendicular direction of the lower incisors. In animals, these teeth slant backwards, and the jaw also slopes backwards directly from the alveoli, so that the full, prominent chin, is found only in man, while in animals it seems as if it were cut off. In

man, the obtuse tubercles of the grinders are very particular, not resembling the flat crowns with rising ridges of intermixed enamel, belonging to herbivorous animals, nor the cutting and tearing grinders of carnivorous ones.]

There are three periods of life in which dentition, or the breeding and cutting of teeth, uniformly takes place—in infancy, in boyhood, and adult age. Besides which, we meet with instances occasionally of a reproduction of teeth in advanced life. Each of these formations is accompanied with circumstances peculiar to itself; and when attended with pain or morbid action of any kind, affords a distinct modification of the present species of disease, and consequently lays a foundation for the four following varieties :—

α	Lactentium. Milk teething.	Cutting the milk or shedding teeth.
β	Puerilis. Permanent teething.	Cutting the second set, or permanent teeth.
γ	Adultorum. Adult teething.	Cutting the adult or wise teeth.
δ	Senilium. Climacteric teething.	Cutting teeth in advanced life or old age.

Before we enter upon the symptoms of these varieties, it is necessary to give some explanation of the causes which produce them; or, in other words, to take a brief glance at the order and economy of dentition.

As the jawbones of youth are both wider and longer than those of infancy, it is obvious that the teeth which are cut in the first year, must be incapable of filling up the bony arch of the fourteenth. They might, indeed, have been so contrived as to grow in proportion to the increased range of the jawbones; but from their being extraneous bodies, this must have been a complex process, while the very circumstance of their growth, and the internal change which must have continually taken place, would have exposed them to many more diseases than they are subject to at present.

A much simpler plan has been devised; and the teeth of man, as indeed of most mammalia, are composed of two distinct sets, differing both in number and structure: the first, or smaller set, consisting of ten for each jaw, which are cut between the [sixth and twenty-fourth month after birth; the most common period of their first appearance, however, being the commencement of the seventh,*] shed between the seventh and fourteenth year, and from the period of their protrusion called milk-teeth; and the second, or larger set, consisting of fourteen, fifteen, or sixteen for each jaw, for they occasionally vary in number, which are cut progressively, upon the shedding of the first set, between the seventh or eighth, and the seventeenth or eighteenth year; and which, from their continuing till old age, except in cases of accident or disease, are denominated permanent teeth. The farthest grinder on each side, however, is seldom cut so early as the eighteenth year, generally after the twentieth, and sometimes not till the thirtieth; on which account, these teeth are denominated *dentes sapientiæ*, or teeth of wisdom.

Although, in the human subject, the teeth are of no use until a certain time after birth, preparations for their formation commence in the early stages of fœtal life. Then the rudiments of all the first set, and of four belonging to each jaw of the second set, are produced, and may be distinctly seen when the fœtus is about four months old: M. Serres declares that he has traced them, and even the teeth, at three.* [The jaw of a new-born child contains a number of cells, separated from each other by imperfect bony septa. By removing the external or internal plate of the jaw, the contents of these cells are exposed. They consist of membranous bags, named the *capsules* of the teeth, enclosing the rudiments of the bodies of these organs, and certain soft vascular substances, termed the *pulps*, on which the bodies of the teeth are forming. The bone of the body of the tooth is the part first formed; the enamel is added to this; and the fang appears the last in order. The pulp, which, according to Meckel, grows up from the bottom of the capsule, about the fourth month of fœtal existence, accurately resembles in shape the body of the tooth which is to be formed on it. It is a soft, vascular substance, and its vessels are most numerous in that part which is covered by the portion of tooth already formed. The capsule is a whitish membrane, but very vascular on its inner surface. It includes the pulp, round the basis of which it adheres, and the rudiments of the imperfect tooth. On its outer surface it adheres firmly to the gum; so that, if we attempt to tear the last mentioned part away from the jaw of a fœtus, the capsules and their contents will come away at the same time. These membranes adhere less closely to the bony cells in which they are contained. The office of the capsule is that of secreting the enamel: in its cavity is a small quantity of fluid. The ossification commences by the formation of the cutting edge of the incisors, and the grinding basis of the molares. The bony substance being deposited on the pulp, as on a mould, the rudiments of the teeth are necessarily hollow; and the bony layers first formed, are those which will be in contact with the enamel when it is deposited. As the formation of the tooth advances, the pulp

* Meckel's Anatomy, trans. by Doane, vol. iii., p. 237. A tooth, considered in the most general view, is essentially composed of two parts: one of these, which is constant and always the same, is the secreting part (the soft portion or pulp); the other, which is more or less developed according to the nature of the animal, and varies in shape, disposition, and number of its layers, is the secreted part; the hard portion placed on the edges of the jaws, and sometimes on the vault of the palate, or at other points of the cavity of the mouth.—See Andral, Anat. Pathol., t. ii., p. 259.

* Essai sur l'Anatomie et Physiologie des Dents, p. 3. 8vo. Paris, 1817. Andral states, that their rudiments may be detected in the 10th week, as their pulpy portion is then in the jaw; and that, at three months, it is covered with osseous points. —Anat. Pathol., t. ii., p. 259.—Editor.

is gradually surrounded, till the whole is covered by bone, except its base.

The adhesion of the pulp to the newly-formed tooth or bone is very slight, and no vessels can be discerned going from one to the other: it is, however, most strongly attached round the thin elastic edge, which is the last part formed. When the bone has covered all the pulp, it begins to contract a little, and becomes somewhat rounded, making that part of the tooth which is called the *neck*, and from this place the *fangs* begin. The formation of the fangs makes the bodies of the teeth ascend through the sockets, and afterward through the gum, which is absorbed in consequence of the pressure of the tooth.

The pulp has originally no process answering to the fang; but, as the cavity in the body of the tooth is filled up by the ossification, the pulp is lengthened, and the fang forms over it. The latter part grows in length till the whole body of the tooth is pushed through the gum, the socket at the same time contracts at its bottom, and grasps the neck or beginning fang, adheres to it, and rises with it. Thus the alveolus is raised with the fang, and the fang does not itself sink or descend into the jaw.

If two or more fangs are to be formed, the process is rather more complicated. When the body of a molaris is completed, there is but one general cavity in the tooth, from the brim of which the ossification is to shoot, so as to form two or three fangs; if two only, then the opposite parts of the margin of the cavity shoot across where the pulp adheres to the jaw, meet in the middle, and thereby divide the mouth of the cavity into two openings, from the edges of which the two fangs grow. It is a curious circumstance, however, that at the very time when the pulp is restricted to the crown of the tooth, the number of future fangs is already denoted by that of distinct branches given off by the dental vessels.—(*Meckel's Anatomy*, vol. iii., p. 232.) When the surface of the tooth first appears through the gum, its body is yet more hollow than that of a perfect tooth, and the fang is only in an incipient state. In proportion as the tooth rises through the gum, however, the hollow is gradually filled up, and the fang is lengthened. When the bone of the body of the tooth is somewhat advanced in its formation, the enamel begins to be deposited on its surface from the vessels of the capsule. This deposition commences on the masticating surface of the tooth, and thence extends towards the root. The enamel is complete when the fang of the tooth begins to be produced, for at that time the body penetrates the gum, and thereby lays open the capsule, which at this period is found to have undergone great alteration in its texture and appearance. Instead of the soft vascular surface which it exhibited while the deposition of the enamel was going on, it is now dense, and almost tendinous, with very few bloodvessels. When the fang begins to grow, the capsule also becomes connected to it, and forms its periosteum.]

From what has been said, it appears that the alveolus, or socket shoots up from the jawbone as the tooth advances. It accompanies its growth, and at first entirely surrounds it; by which admirable contrivance a firm support is given to the gums from the time of birth, and the infant is enabled to make a sufficient pressure for the purpose of sucking, without interfering with the form which the teeth, yet soft and amorphous, are destined gradually to assume. In due time, however, the alveolus yields in its upper surface, as the tooth, in consequence of the gradual elongation of its fang or fangs, is forced through, and cuts not only the socket but the gum; and when the first set, having answered its temporary purpose, loses its fangs by absorption, and the body of each tooth is shed or cast out by the gums, the attendant sockets are equally absorbed, and disappear at the same time.

This wonderful change begins to take place, as I have already observed, about the seventh year, the artery of the milk teeth and its canal undergoing a more or less perfect obliteration (*Serres*, p. 19); at which time we possess far more teeth, including both the grown and the growing, than at any other period whatever: for we have in each jaw ten temporary teeth complete, ten incomplete to succeed them, and the two permanent grinders, whose stamina were formed during fœtal life, making not less than forty-four in the whole. Other writers than Mr. Hunter place this change at an earlier period: Dr. Blake, indeed, as early as the fourth year; and M. Lemaire, who follows Blake in most other points, follows him in this also. The permanent teeth have separate sockets of their own; and, in consequence of the prolongation of the jawbones, do not lie immediately under the corresponding shedding teeth, nor directly contribute to the process of shedding, which chiefly takes place in consequence of the absorption of the fangs and sockets of the temporary set, though their ascent contributes in some degree to the general process.

I have observed that the alveoli, or sockets, though fixed upon the jawbones, and indeed issuing from them, are rather to be regarded as appendages of the teeth than of the bones from which they spring; that they participate in most of the diseases of the teeth, and are strictly coeval with them; sprouting forth on their origin, modelled by their shape, and disappearing on their decay or removal. It is this disappearance, which is the work of absorption, that principally produces that change in the character of the face which peculiarly distinguishes the period of old age. It follows closely upon the loss of all the teeth; and when these have uniformly given way, and their respective sockets are no longer in existence, as not being wanted, the upper jaw becomes considerably diminished in its range, the under jaw reduced to a thin bone merely covered by the gums, and the roof of the mouth, instead of being arched, is rendered almost flat. And from this loss of substance, which is nearly equal to an inch and a half in depth, the face becomes shortened, the cheeks wrinkled, and the chin projecting.

It is curious to observe how differently the teeth are situated in different animals. In the more perfect, they are placed in sockets in the jawbones, some of which are in many kinds rendered moveable, as the two fore teeth of the lower jaw of the *mus maritimus*, or African rat, the largest species of the genus hitherto discovered. The same teeth are equally moveable in the kangaroo; and the hollow tusks or poisoning fangs of the rattlesnake, and other venomous serpents, are capable of depression or elevation at the option of the animal. In the lamprey and myxine the teeth, which are almost innumerable, are placed on the surface of the tongue; in the cancer genus, in the stomach; where we likewise find them in the common earwig. In the cuttle-fish, they are also placed in the middle or lower part of the body, two in number, and horny, and in their figure resembling the bill of a parrot. In the echinus, or sea-hedgehog, they are five in number, arranged around the opening of the under part of the shell, and, being moveable by different muscles, they form a very complete organ of mastication. In the *aphrodita aculeata*, or sea-mouse, they are fixed upon the proboscis, four in number, and are consequently extended or retracted with this organ at pleasure. The leech has three pointed cartilaginous teeth, which it is able to employ in the same way, and by means of which it draws blood freely.*

The form of the teeth is so different, even in the different genera of animals that possess them in a true or perfect state, that this diversity has been laid hold of by many naturalists, as a distinguishing characteristic of their kinds or orders. Linnæus, confining himself to the fore teeth, has hereby formed seven distinct orders for the class of mammalia; and M. de Blainville, carrying the basis of this distinction farther than to the form and structure of the fore teeth, has made it a foundation for the subdivisions of these orders into genera.†

Whatever be the time in which teeth are generated and protruded, the process is often so gradual that little or no pain or other inconvenience is experienced; and, consequently, under such circumstances, there is no disease. But I have already observed, that there is often not only pain and irritation, and therefore disease, but, in various instances, disease of a severe, complicated, and alarming character. And it is to *dentition* under these circumstances, that I am now about to direct the reader's attention.

It will readily be supposed, that the most violent symptoms of dentition are those produced under the first stage referred to in the preceding history, or during the growth and protrusion of the MILK or SHEDDING TEETH; for the system is then in its tenderest state of infancy, and prone to disorder from very slight causes of irritation.

The immediate cause of irritation in the present instance, is the pressure of the teeth in the gums; and the degree of irritation depends upon the peculiar temperament of the child. [But, in addition to this circumstance, it may be stated as a general fact, that, the greater the number of teeth coming forward simultaneously, the greater the risk of indisposition; and every man of experience knows that those children which cut their teeth late, usually suffer least.] As the teeth push forward, the superincumbent gum wastes in consequence of absorption, and is at last cut through, and the tooth makes its appearance. This pressure is not, however, uniformly exerted through the whole course of teething, but is divided into distinct periods or stages; as though the vital or instinctive principle, which is what we mean by nature, becomes exhausted by a certain extent of action, and then requires rest and a state of intermission. The first active stage of teething is usually about the third or fourth month of infancy; and constitutes what is called breeding the teeth, or the production of their bone from the pulpy rudiment, buried in the gum, and formed during fœtal life, which at the same time shoots downwards, and gives to every tooth a neck and fang. The first and most usual symptom of this change, is the looseness with which the infant grasps the nipple, and the frequency with which it lets go its hold, accompanied with fretfulness and crying, and succeeded by a copious discharge of saliva, the salivary glands partaking of the irritation of the gums. Next, the uneasiness of the gums is found to be relieved by the pressure of any hard substance upon them which benumbs their excited sensibility; and hence the child is pleased with having its gums rubbed with the fingers, a coral, or a gold ring.

This last is perhaps the oldest method, and it may be the best: for the experiments of Dr. Chrestien, of Montpellier, who has of late endeavoured to revive the old preparations of gold as a part of the materia medica, show sufficiently that this metal, in very slight quantities of some of its simplest forms, is peculiarly active, and a powerful exciter of those secretions which have a tendency to diminish irritation and subdue inflammatory action. He has proved before a committee of the Royal Academy of Sciences at Paris, that friction of the tongue and gums with not more than four grains of powder of gold, produces sometimes a copious ptyalism, sometimes abundant alvine evacuations, and sometimes profuse perspiration.* Friction by the finger, or any other means, is sometimes condemned, as likely to render the gum callous, and consequently more difficult to be cut through; but, so far as I have observed, this idea is not supported by facts. In many respects, M. Lallemand has since confirmed Dr. Chrestien's observations.†

* See, for other peculiarities, Phil. Trans., vol. lxxxix., p. 237.; xci., p. 319.

† Nouveau Dict. d'Hist. Naturelle, vol. ix., art. DENTS. Paris, 1817.

* Recherches et Obs. sur les Effets des Préparations d'Or. 8vo. Paris.

† Journ. Générale des Sciences Médicales, Août, 1822. Rousseau, in his Emilius, objects to rubbing the gums with hard substances, and refers to the instinct of other animals, which leads them to exercise their budding teeth, not on bones or stones,

If the irritation become very considerable, the gums swell, the child grows still more fretful, and starts in its sleep; or, on awaking suddenly, there is heat, thirst, and other concomitants of pyrexy, with perhaps dulness or drowsiness; the bowels are affected, which is a common symptom, and a rash appears on the skin, usually the *red-gum;* and if the irritation extend to the muscles of the chest, there is a dry and troublesome cough. It is the opinion of Dr. Withers, as given in his treatise on asthma, that a cough during dentition never takes place but from primary affection of the respiratory organs: yet I have often seen this effect produced as evidently from mere sympathy, as increased flow of saliva, or looseness of the bowels. In about ten days or a fortnight, these symptoms subside; and though the infant may occasionally be teased with slight paroxysms of uneasiness, it generally passes on without much inconvenience till the arrival of the second stage, or period of cutting the teeth, which we may expect to take place between the seventh and the close of the ninth month, though sometimes this does not occur till a few months later.

This is the usual progress; but here, as in many other organs of the system, we sometimes meet with a singular precocity of action, and, at other times, with as extraordinary a hebetude: and hence, while it is no uncommon thing for an infant to be born with several of its milk-teeth already cut, a fact which has in various instances occurred to my own observation, and is specially noticed by Helwig* and other writers; sometimes these teeth are extremely tardy in their appearance, and, in one instance, are said not to have been protruded before the child was ten years old.† [M. Dugès saw an example in which no teeth were cut till the age of eleven; and Smellie refers to instances of much greater retardation, where persons were twenty-one or twenty-two years old when their teeth first appeared. The appearance of teeth at birth is sometimes alleged to be particularly frequent in infants born after the usual period (*Meckel's Anat.*, vol. iii., p. 242); but such premature dentition is neither a proof of protracted pregnancy, nor yet of, what is also stated, a strong constitution in the infant, which is often unusually small, and does not thrive. We have, indeed, high authority* for the observation, that perfectly ossified teeth are sometimes cut in the fœtus of only six months.]

It is the opinion of Mr. Fox (*History of the Teeth*, p. 6), that the premature teeth, which are usually the central incisors of the under jaw, are nothing more than the upper parts or crowns of teeth without the apparatus of fangs; that they have consequently a weak attachment to the gums, soon get loose, and produce a considerable inflammation in the mouth of the child, as well as great inconvenience to the mother; and he recommends, accordingly, that they may be immediately extracted. Speaking generally, this account may be correct; but, as there are instances in which teeth of this premature growth possess fangs, and are perfect, it is better to wait before we extract them till some inconvenience arises which may call for their removal.

It is somewhat singular, that the natural growth of the first set of teeth does not seem to be varied, at least according to any general rule, by the degree of strength of the infant; for weakly children often cut their teeth even more rapidly than those in robust health, though the reverse is perhaps more generally the case; and hence the stimulus of irritation, in the process of dentition, very nearly keeps pace with that of healthy vigour.

At this time the gum is often extremely sensible, and, instead of being eased by the pressure of a hard substance, cannot endure the slightest touch. At the base it is florid and distended, but paler and whiter at the edge or upper part; and, when the tooth is on the point of protrusion, seems covered with a flat and whitish blister.

The other symptoms are a repetition of those just described, with a scabby eruption about the lips or head, erythematic inflammation behind the ears, and occasionally spasmodic movements of the mouth and jaws, convulsions, or epilepsy.

The grand point is here to moderate the local irritation. A diarrhœa, or full discharge of saliva, does this naturally, and hence these are favourable symptoms. And if the former be too violent, or accompanied with griping, it should be merely corrected by magnesia or prepared chalk, [or rhubarb combined with ipecacuanha, or hydrargyrum cum creta. If the evacuations are fetid, blackish, or very pale, an occasional dose of calomel, to improve the intestinal secretion, should be given. In particularly obstinate cases, the cautious use of the compound powder of ipecacuanha, with minute doses of calomel, is sometimes adopted. If the milk seem to disagree, the nurse must be changed, and beef-tea, rice-milk, and arrow-root

but softer substances. In accordance with this view, a stick of marsh mallows, or of liquorice root, a piece of wax candle, or a crust of bread, has been recommended instead of coral; and in France, they often dip the substance in honey, or a sweet decoction of barley. In some parts of Germany, children are frequently seen sucking a small bag, containing a mixture of sugar and spices, which is given to them whenever they are fretful. By keeping them quiet, the nurse is saved trouble; but the derangement of the stomach likely to arise from so free a use of these sweet stimulating ingredients, must be objectionable.—See DENTITION, in the Cyclop. of Pract. Med., p. 518.—ED.

* Obs. 28. Richard III., Louis XIV., and Mirabeau, seem to have been born with some of their teeth already cut; but the circumstance is common enough in all ranks of society.—ED.

† Eph. Nat. Cur. Dec. II. Ann. IV. Obs. 28. In all probability these were really the permanent teeth, and not the milk ones, as mentioned in the text. In such cases, Andral concludes, that the failure of the first dentition must be owing either to the non-existence of the germs, or else to the pulp, though developed as usual, not secreting the hard portion.—Anat. Pathol., t. ii., p. 260.—ED.

* Andral, Anat. Pathol., t. ii., p. 160.

given. In many cases, small doses of quinine are useful auxiliaries; but since a moderately lax state of the bowels lessens the risk of worse consequences from dentition, the practitioner should not be in too much haste to check the evacuations; and probably, as Dr Joy has observed, it should never be done so long as the appetite, sleep, and strength, continue unaffected.] If the bowels be confined, we must employ cooling laxatives; and the discharge of a small quantity of blood from the gums in the first stage, by lancing them, will often afford effectual relief. If the symptoms of oppression or spasmodic action be severe or incumbent, as drowsiness, difficulty of breathing, stertor, or irregular motion of the jaws, antimonial emetics and leeches should be had recourse to, and occasionally repeated; after which, blistering will be found useful, behind the ears or on the back. And when the bowels have been thoroughly emptied, the use of anodynes may be allowed, and will generally prove highly serviceable; though they should be employed with great judgment, and never intrusted to nurses. Hyoscyamus, in most of its forms, has often succeeded here, as well as in adult toothache, when judiciously administered.*

In the second stage, or when the teeth are on the point of protrusion, the lancet will often afford immediate relief, not by a discharge of blood, for the upper part of the gum is now become so thin and wasted that little or none will follow; but by giving a direct opening to the tooth, which will frequently make its appearance in the course of a few hours. It is singular, that the use of the lancet should be objected to so generally. The tooth is imprisoned by a membrane that surrounds it on a full stretch, and that is in a state of inflammation. Lancing the gum, or rather the inflamed membrane below the gum, takes off the tension, and sets the tooth free. The pain is slight and transient, and by no means to be compared with the permanent uneasiness which the operation undertakes to relieve. It has been conceived, that a tough indurated cicatrix will be formed if the divided edges of the gum should unite after the lancet has been applied. Yet in the spongy texture of this organ, no such effect is found to follow; but, on the contrary, the recently united edges of the gum, as in all other parts, far more easily give way to the process of absorption than they would otherwise have done; by which means the passage of the tooth is facilitated.†

As the erythematic inflammation which occasionally takes place behind the ears, proves often useful as a revellent, it has also been found sometimes serviceable to imitate it by a friction with savin ointment, or other rubefacients. But I cannot advise that this or any other eruptions, when produced naturally, should be suffered to run their course without restraint: for I have often known them become a worse evil than the original disorder. In this case, they should unquestionably be exchanged for some other more convenient discharge.*

In cutting the SECOND OR PERMANENT SET OF TEETH, it is not often that much uneasiness is encountered; for, firstly, their progress is much slower than that of the shedding-teeth; and next, the constitution, with the acquisition of a greater degree of strength, is at this time become much less irritable. In a few cases, however, they push forward too rapidly, and urge the shedding-teeth against the superincumbent gums so forcibly as to excite considerable pain; and here a free application of the lancet affords the speediest and most efficacious relief. And not unfrequently the permanent teeth ascend with great irregularity, and press against the crown or fangs of those above them in erroneous directions; whence another source of considerable pain. In this case, the best, and indeed the only radical cure, is to extract the upper or cutting tooth, and thus allow freedom to the under tooth to right itself.—(*De l'Arrangement des Secondes Dents, &c., par M. Duval Brock*, 8vo. Paris, 1820.)

[The milk-teeth occasionally continue in the jaw long after the common period of their being shed; and, as this circumstance does not necessarily prevent the permanent ones from being cut, the jaw seems at first really to contain a preternatural number of teeth; but, in most instances of this kind, the appearance of the permanent teeth is retarded, or they are even wanting; a circumstance fully accounting for the anomaly of the extraordinary continuance of the others.—(*Meckel's Anat.*, vol. iii., p. 242.) The permanent teeth occasion the falling out of the milk ones principally by destroying by their pressure the vessels and nerves of the latter, as well as their adhesion to the alveoli. The destruction of the fangs is not an invariable effect, as the milk-teeth, when they

* Among other means, the warm bath, or pediluvium, and opiate frictions on the spine, deserve to be mentioned: the latter are sometimes preferred to narcotics by the mouth.—ED.

† For some excellent remarks on the morbid effects of dentition, see a paper by Prof. James Jackson, in the New-England Journal, vol. i., pp. 12, 113, 329.—D

* The principal disorders accompanying dentition are imputed by Dr. John Clarke, in his commentaries on the diseases of children, to plethora from over-feeding, and to the head being kept too warm. In fact, painful dentition itself brings on a great determination of blood to this part of the body. Hence Dr. Clarke, with the view of preventing bad effects, recommends us to wash the head daily during dentition with cold water, and, if a moderate salivation and lax state of bowels are not present, he directs the use of gentle aperients.

The chylopoietic and respiratory organs, the brain and nervous system, the skin and the lymphatics, are the chief seats of the sympathetic affections occasionally induced by dentition. The best description of a spasmodic affection of the glottis, excited by dentition, is that by Dr. Marsh, in vol. v. of the Dublin Hospital Reports. For an account of a peculiar swelling of the backs of the hands and feet, occasionally brought on by the same cause, consult the writings of Underwood and Dr. Kellie of Leith.—ED.

are shed, sometimes have those parts very perfect.]—(*Serres*, op. cit., p. 102.)

In the formation, and especially in the cutting, of the third set, OR WISE TEETH, we ordinarily meet with a far more considerable degree of pain and inconvenience, and this too for many weeks; and the pain spreads by sympathy to the ear, which is often more affected than the tooth itself. Such is especially the case where the formation takes place late, and after the jawbones have ceased to grow, and the gum has become thick and callous; for we have here a want of sufficient room, and little power of enlarging it by absorption. In the upper jaw, moreover, the tooth on each side is frequently obliged to incline backward, by which means it presses on the anterior edge of the coronoid process in shutting the mouth, which causes an additional degree of uneasiness; while, in the lower jaw, some part of the tooth continues to lie hid under the coronoid process, and the portion of the gum that covers it is perpetually liable to be squeezed by the tooth below, and the corresponding tooth in the jaw above. In this case nothing but a very free crucial opening will suffice; and often nothing but an excision of a very considerable piece of the callous gum: while there are other instances, in which the evil can only be cured by removing the tooth itself.

We sometimes, though rarely, meet with playful attempts on the part of nature to reproduce TEETH AT A VERY LATE PERIOD OF LIFE, and after the permanent teeth have been lost by accident or natural decay.

This most commonly takes place between the sixty-third and the eighty-first year, or the interval which fills up the two grand climacteric years of the Greek physiologists; at which period the constitution appears occasionally to make an effort to repair other defects than lost teeth, on which we shall have occasion to treat more at large, when describing that variety of decay, which, in the present system, is denominated climacteric.

For the most part the teeth, in this case, shoot forth irregularly, few in number, and without proper fangs; and even where fangs are produced, without a renewal of sockets. Hence they are often loose, and frequently more injurious than useful, by interfering with the uniform line of the indurated and callous gums, which, for many years perhaps, had been employed as a substitute for the teeth. A case of this kind is related by Dr. Bisset of Knayton, in which the patient, a female in her ninety-eighth year, cut twelve molar teeth, mostly in the lower jaw, four of which were thrown out soon afterward, while the rest, at the time of examination, were found more or less loose.—(*Edin. Med. Comment.*, vol. viii., p. 373.)

In one instance, though never more than in one, Mr. Hunter (*Nat. Hist. of the Teeth*) witnessed the reproduction of a complete set in both jaws, apparently with a renewal of their sockets. "From which circumstance," says he, "and another that sometimes happens to women at this age, it should appear that there is some effort in nature to renew the body at that time."

He alludes to a restoration of the catamenia, and to the climacteric change, which we shall have occasion to notice hereafter. The author of this work once attended a lady in the country, who cut several straggling teeth at the age of seventy-four; and at the same time recovered such an acuteness of vision as to throw away her spectacles, which she had made use of for twenty years, and to be able to read with ease the smallest print of the newspapers. In another case that occurred to him, a lady of seventy-six, mother of the late Henry Hughes, Esq., printer of the Journals of the House of Commons, cut two molares, and at the same time completely recovered her hearing, after having for some years been so deaf as to be obliged to feel the clapper of a small hand-bell, which was always kept by her, in order to determine whether it rang or not.

The German Ephemerides contain numerous examples of the same kind; in some of which, teeth were produced at the advanced age of ninety, a hundred, and even a hundred and twenty. One of the most singular instances on record is that given by Dr. Slade (*Phil. Trans.*, vol. xxvii., year 1713), which occurred to his father; who, at the age of seventy-five, reproduced an incisor, lost twenty-five years before; and at seventy-seven reproduced another to supply a similar vacancy, so that at eighty he had hereby a perfect row of teeth in both jaws. At eighty-two they all dropped out successively; two years afterward they were all successively renewed, so that at eighty-five, he had once more an entire set. His hair at the same time changed from a white to a dark hue; and his constitution seemed in some degree more healthy and vigorous. He died suddenly, at the age of ninety-nine or a hundred.

Sometimes these teeth are reproduced with wonderful rapidity; but, in such cases, with very great pain, from the callosity of the gums, through which they have to force themselves. The Edinburgh Medical Commentaries (vol. iii., p. 105) supply us with an instance of this kind. The individual was in his sixty-first year, and altogether toothless. At this period, his gums and jawbones became painful, and the pain was at length excruciating. But, within the space of twenty-one days from its commencement, both jaws were furnished with a new set of teeth, complete in number.

The jugglers on the continent, a century or two ago, were in the habit of taking advantage of this occasional playfulness of nature, and offering, as natural phenomena in the formation of teeth, singularities which nature never dreamed of. Thus, a boy was at times started and hawked about the country with a golden tooth, much to the astonishment of both the learned and the unlearned; for though the tooth was in reality a natural one, and only covered over with an inlay of gold, yet the gilding was in one or two instances so exquisitely effected as to deceive almost every spectator, when the trick was first brought forward, and to lay a

foundation for no small number of learned descriptions and profound explanations upon the subject.*

SPECIES II.
ODONTIA DOLOROSA
TOOTHACHE.

ACUTE PAIN IN THE TEETH, OR THEIR INVOLUCRES.

THERE is often a considerable degree of pain of a particular kind that accompanies the irritation of the last species: but it is rarely, if ever, of an acute character; and is rather a sense of soreness about the tooth than an ache within it: and hence the definitions now offered are sufficiently distinct.

Pain of this kind may be produced by various causes, as a catarrh, or cold; an exostosis or deposite of earthy matter on the sides of a tooth or its socket; a caries or decay; a peculiar affection of the nerves of the sockets or jawbone, acting upon a tooth by contiguous sympathy, and hence not relieved by extracting the tooth that is suspected. It may be produced also by some remote influence, as that of pregnancy, or sordes in the stomach; by a peculiar diathesis, as that of rheumatism, or scurvy; by the long use of mercury; or by a transfer of action, as in some cases of gout, in which the pain is often most vehement and agonizing, and in various instances has produced convulsions, and in others delirium; or, in the language of the sufferers themselves, has actually driven them mad. In several of these cases, it occurs as a mere symptom of some other disease; and can only be cured by a removal of the disease that gives rise to it. The following varieties, however, seem well worth attending to, and will generally be found to result from a primary affection;

α Catarrhalis. Catarrhal toothache.	From cold.
β Cariosa. Carious toothache.	From decay or caries.
γ Exostosa. Nodose toothache.	From ossific deposite.
δ Nervorum. Nervous toothache.	From irritability of the dental or adjoining nerves.

Every tooth has an internal cavity, which commences at the point of its fang, and enlarges as it ascends into its body. This cavity is not cellular or rugged, but smooth on its surface: it contains no marrow, but appears to be filled with bloodvessels, accompanied with nerves, which must necessarily be derived from the second and third branches of the fifth pair, though they have never been distinctly traced. In the interior of this cavity the teeth appear to be peculiarly sensible; and hence direct or indirect EXPOSURE TO THE EXTERNAL AIR; or, in other words, a carious opening, or a current of sharp air without such opening (for the air seems in many instances to act through the substance of a sound tooth), will produce acute pain, and is, in fact, the common cause of toothache. The pain thus produced will sometimes cease very suddenly, and especially upon the application of an opiate, or some acrid essential oil. But the irritation is often communicated to the periosteum of the tooth, and thence to the membrane that lines the socket, which is only a duplicature of it. And hence, the pain will often become permanent from inflammation excited in these tunics, now thickened and tense, and at the same time incapable of relieving themselves by stretching; while, if a rheumatic or gouty diathesis prevail, the pain may become intermittent or periodical.

In all these cases, wherever we can trace in the tooth a hole opening externally, the readiest and most effectual modes of cure will consist in stopping up the hole with a metallic or some other substance, so as to defend the tooth from the access of cold; or in destroying the affected nerve by caustics or cauteries, introduced through the hole itself. The pain may also be occasionally diminished by the application of opium or the more acrid aromatic oils, especially that of cajeput, which is a distillation of the leaves of *melaleuca leucodendron*, either directly to the nerve in the tooth, or to the extremity of those nerves in the skin, which are branches of the same pair.* These medicines act by exhausting the sensibility of the nerve: and hence relief is procured by ammonia and rubefacients; or by a blister behind the ear of the affected side; by burning the edge of the helix of the ear; rubbing the cheeks with the *cerambix moschatus*, which possesses a vesicatory power nearly equal to that of the lytta; holding brandy or hot water in the mouth; or applying the sedative juices of the lady-bird, or *coccinella septem-punctata*, as well as that of several other insects, to the tooth or gums, after bruising them for this purpose between the thumb and fingers. The root of the *petiveria alliacea*, or guinea-hen weed, a very acrid plant, is employed for the same purpose by the inhabitants of Jamaica, who put a small plug of it into the diseased cavity.—(*Trans. Stockh. Acad.*, 1644, p. 287.)

So the mastication of various other aromatic or stimulating plants will often produce a similar effect, and especially those that at the same time rouse the salivary glands to increased action, as the bulbs of the alliaceous plants, the root of several of the seselis, particularly the *seseli vulgare*, the common hartwort, or *laserpitium siler*, Linn.

Such masticatories, however, are chiefly of use in the toothache produced by rheumatism, or where congestion has taken place in the neighbouring parts from inflammation of any other kind. The sensibility of the nerves may hereby, indeed, be in some degree exhausted, but it is the evacuation that principally affords relief. Or

* Horstius, De Aureo Dente, Lips. 1695, 8vo. Ingolstetter, De Aureo Dente Silesiaci Pueri, Lips. 1695, 8vo. Tylkobsky, Disquisitio duorum Puerorum, unus cum Dente Aureo, alter cum Capite Giganteo, in Lituania visus. Olivæ, 12mo.

* The oil of the anthemis pyrethrum also, is useful in assuaging the pain of toothache.—D.

this principle relief is also not unfrequently obtained by smoking or chewing tobacco, and, as Dr. Cullen conceives, by the use of camphire (*Mat. Med.*, vol. ii., p. 304); though the camphire and tobacco may partly operate by the sedative power they possess. As errhines promote the same secretion as sialagogues, these have also been frequently employed with considerable success, as well in toothaches as ophthalmias; in both which cases, however, preparations of asarum have generally been found to produce more alleviation than those of tobacco, which is the basis of our common snuffs. A local application of cantharides in powder or ointment is inconvenient, but the tinctura cantharidis may be often used effectually with little trouble; yet the most elegant form of this stimulant for the present purpose is that of the French Pharmacopœia, under the name of Oleum de Cantharidibus. It is made by digesting for six hours, with a gentle heat, one part of powder of cantharides in eight parts of olive oil (*Codex Medicamentarius*, Paris, 1818); the oil thus impregnated is to be filtered, and is then fit for use.

Electricity has also been tried, and occasionally with success. On the continent, magnetism has been a still more favourite remedy; and has at least more writers in its recommendation,* whatever be the actual benefit it may have produced, of which I cannot speak from personal knowledge. Animal magnetism seems at one time, indeed, to have been very extensively employed for this as well as for other severe pains; and, if we may credit the writers of a century or a century and a half ago, with instant and specific effect. The grand magnetiser of the day was the then celebrated Valentine Greatrake, who operated by stroking his hands over the parts affected, much in the same manner as Mr. Perkins of America, not many years ago, employed his metallic tractors.—(Stubbes, An account of several marvellous cures performed by the stroking of the hands of Valentine Greatrake. Lond. 1666. 4to.) And as strong emotions of the mind are well known to produce a more immediate influence on the toothache, than on any other disease whatever, we may readily account for some of the cures hereby produced. Confident hope is as strong a stimulant as terror; and the latter is well known to operate so generally, that it is a rare fact for a person to be actually suffering pain just before the operation of extraction.

The stopping of a carious opening in a tooth should only be attempted when there is no pain; for otherwise the pain will be increased by the introduction of a foreign body. The substances chiefly employed for this purpose, are gum-lac, bees'-wax, sealing-wax, tin, lead, and gold. The metals, and especially tinfoil, are among the most useful, as they afford the best guard, and far less frequently require to be renewed. Yet none of them can be easily retained in cases where the opening is wider at the top than the bottom; and although attempts have been made to keep them in the proper situation by drilling a small hole through the sides of the teeth, and riveting a proper pin into the metallic substance, they soon become loose, and admit air, food, and other acrimonious materials.

Mr. Fox mentions a compound metallic substance, as far better calculated to answer the purpose of a permanent plug, than any of the preceding. It is obtained by mixing several metals together, which, by the process made use of, become fluid at the temperature of boiling water; on which account it has been called fusible metal. It is supposed that this may in consequence be employed in a liquid state, and thus have an opportunity of striking, before it becomes cool, into all the ramifications of the carious part, so as to fill up the cavity completely, and form a fixture not easily to be detached.

It has often occurred to me that some of the drying earths, employed as cements by our stonemasons, and which harden into an indissoluble plate or mass under water, might be used with more success for this purpose than any other substance; especially tufa or tuffwacke, as Schmeisser calls it, and tarras, which are compounds of iron, alumine, silex, and carbonate of lime. Introduced into the cavity of a carious tooth in the form of soft paste or mortar, they will easily dry, and harden, and adhere, and no moisture of the mouth will dissolve them.

If these methods should not succeed, we may attempt a cure by endeavouring to stupify the nerve of the tooth by a frequent use of hot essential oils intermixed with camphire and opium, or we may destroy it directly by a hot iron. And if these methods fail, and the excision of the crown of the tooth, as practised by Mr. Fay with a pair of cutting forceps, should not be deemed advisable, the only alternative is extraction, which, however, should never be had recourse to till the above plans have been skilfully tried; for, first, the pain may proceed from an affection of the socket, and in this case the pain of tooth-drawing will have been incurred for no purpose; and, next, a carious tooth, whose nerve has been destroyed or rendered torpid, may be of very essential service, as well as ornament, for many years, perhaps through the whole of life. Yet if the caries be accompanied by inflammation in the surrounding parts, the tooth should be removed without loss of time; as the mischief may spread, and the adjoining teeth be hurt.—(*Manuel du Dentiste, &c. Par C. Maury*, 8vo. Paris, 1820.)

In extracting a tooth, a very troublesome hemorrhage will occasionally follow; sometimes profuse and of long continuance. Plater, Schenck, and others, have indeed given cases in which it has proved fatal.* [Mr. Blagden (*Med. Chir. Trans.*, vol. iii., p. 224) recorded the particulars of one remarkable instance, in which the use of styptics, the actual cautery, a plug in the socket, and even a ligature on the carotid artery,

* De la Condamine, Journ. de Méd., tom. xxvii., p. 265. Glaubrecht, Diss. Analecta de Odontalgia, ejusque remediis variis, præcipuè Magneta. Argent. 1766. Teske, Neuer Versucht in Curirung des Zahnschmerzens vermittelst eines Magnetischen Stahls. Königsb. 1765–6.

* Plater, Obs. Lib. iii., p. 773. Schenck, Lib. i. Obs. 403, 405, p. 99.

failed to suppress the bleeding, which proved fatal a week after the removal of the tooth.] The best ordinary styptic is pressure with an elastic substance, as a piece of sponge covered with wax, touchwood, spunk, or some other spongy boletus, or a dossil of lint dipped in a strong solution of alum or sulphuric acid.* I was not long ago requested to see a young man, who had been profusely bleeding from the gums and socket of an extracted tooth for five days, without cessation, and without sleep, till his wan cheeks and faint, emaciated frame, seemed to indicate that he had scarcely any blood left in his vessels. He was so weak as to be incapable of rising from his bed or taking food; and his stools, from the quantity of blood he was perpetually swallowing, had all the appearance of a melæna. On opening his mouth I found it crammed full of lint wadding, one piece having every hour been added to another, without a removal of the preceding, lest the hemorrhage should be increased, while the blood in which the wadding was soaked, and which had remained in the socket and over the gums for so long a period, was become grumous, putrid, and intolerably offensive.

I first removed the whole of this nauseating load from the patient's mouth, and gave him some warm brandy and water to wash it with. I next directed him to take a goblet of negus with a little biscuit sopped in it, a part of which he soon contrived to swallow. The bleeding still continued; but, as I had no doubt that this proceeded entirely from a total want of power in the lacerated arteries to contract, I applied no pressure of any kind, but prescribed a gargle of equal parts of tincture of catechu and warm water; and the hemorrhage soon ceased.

It is not easy to explain by what means teeth become carious. Out of the body they are indestructible, except by very powerful chymical agents; and yet, in the opinion of many physiologists, they are nearly in the same state in the body as out of it; extraneous substances formed complete at first, without vascularity, growth, or interstitial action, and even destitute of absorbents.

In caries of the bones, observes M. Auzebi (*Traité d'Odontalgie*, &c. Lyons), the decayed part is thrown off, and gives place to a new growth; while, in the teeth, if the enamel be broken, and a caries commence, the carious part is never thrown off, as in the bones, but continues its progress through the parts adjoining; nor can any remedy we know of produce a separation between the part that is sound and that which is unsound. "And we have hence," says he, "a proof that there are no vessels in the substance of the teeth, and that they have a distinct conformation from other bones." Not widely different was the opinion of Mr. J. Hunter, when composing his Natural History of the Human Teeth; an opinion drawn from the impossibility of injecting them, the perfection in which they are produced at first, and their retaining their natural colour after so long a use of madder as food that all the other bones of the body have become thoroughly tinged with it. "But they have most certainly," says he, "a living principle, by which means they make part of the body, and are capable of uniting with any part of a living body; and it is to be observed, that affections of the whole body have less influence upon the teeth than upon any other part of the body. Thus, in children affected with the rickets, the teeth grow equally well as in health, though all the other bones are much affected; and hence, their teeth being of a larger size in proportion to the other parts, their mouths are protuberant." Cuvier, who has adopted all Mr. Hunter's views, has employed the same reasoning (*Dict. des Sciences Médicales*, art. Dents); and M. de Blainville has apparently gone beyond both; for he has denied not only a vascular structure, but even a living principle to the teeth.*

Mr. Fox, however, is said to have succeeded in injecting both the external and internal layer of the dental germ, and even Mr. Hunter himself appears to speak with some degree of hesitation in the treatise before us; and in his subsequent work "On the Diseases of the Teeth," offers observations that seem to show he had at that time embraced a different opinion. In the first essay, indeed, he allows that "the fangs of teeth are liable to swellings, seemingly of the spina ventosa kind, like other bones;" but he immediately adds, that "there may be a deception here, for the swelling may be an original formation." Yet, in the second essay, he treats of this swelling as one of the diseases to which the teeth are perpetually liable; he regards the teeth as subject to the common inflammation of other bones, and, like other bones, evincing, at times, great sensibility through the entire substance of the organ, as well as in the central cavity itself.†

Probably some internal action is continually taking place in the teeth, though we are not able to trace it very evidently. The chief causes of a caries are undoubtedly external, but it may be sometimes produced by an internal cause. We have already noticed exposure to currents of cold air, and the medical practitioners of Germany and the north, appeal to the opposite extreme of the habitual use of hot aliments, as a still more general and mischievous source of the same evil. In the Swedish *Amœnitates Academicæ* (vol. vii., art. 136), we have an elaborate examination of this subject by M. Ribe, who tells us, among other things, that "man is the only animal accustomed to hot foods, and almost the only animal affected with carious teeth." Whence the author takes occasion to condemn, in an especial manner, the custom of drinking hot tea and coffee; and, in accordance with this remark and recommendation, M. Tillæus, another celebrated writer in the same interesting journal, tells us, from Kalm,

* The sulphate of copper will often arrest hemorrhage when other styptics have failed. We have reason to think also, that the nitrate of silver is extremely valuable for the same purpose.—D.

* Nouveau Dict. d'Hist. Naturelle, &c. vol. ix. in verbo.

† At the end of this section, the editor has introduced the chief arguments against the vascularity of the teeth.

in his paper entitled *Potus Theæ*, that the Indians of North America knew nothing of the inconvenience of carious teeth or debilitated stomachs, till tea was introduced among them. There can be no question that the two extremes of heat and cold must be greatly, perhaps equally, injurious to the health; and as little, that the inhabitants of high northern latitudes must suffer more than others from the use of hot aliments, in consequence of the greater coldness of their atmospherical temperature.

To the abuse of hot beverages as a cause of caries, M. de la Salle adds the abuse or excessive employment of sugar; and seems to imagine, that these are the two principal means by which teeth are rendered black in their enamel, and carious in their substance.*

If sugar act at all, it must be by means of the principle of acidity which is contained in it; and, consequently, in proportion to the degree of affinity which this principle bears to the earthy matter or calcareous basis of the teeth and their enamel, beyond that of the acids which enter into their natural composition. And the same may be observed in respect to any other exotic acid whatever.

If, then, we examine the composition of teeth chymically, we shall find, that in their structure they consist very largely of phosphate of lime, with a small proportion of animal matter, and a much smaller of carbonate of lime; and in their enamel, which is altogether of the nature of ivory, that they consist almost entirely of phosphate of lime, with a small proportion of animal matter, and a minute trace of fluate of lime. And, admitting that the same decompositions take place in an organized living structure, or a simply organized structure in a living frame, as when the principle of life has no concern, we have next to inquire whether there be any acids that have a stronger affinity for lime than the phosphoric, for it is scarcely necessary to extend our research to the carbonic, since this can never be attacked till the enamel into which the phosphoric so largely enters be decomposed, and withdraws its protection.

Now, by examining the tables of elective attractions we shall find that there are four, and only four acids, that precede the phosphoric in their affinity for lime; the oxalic, sulphuric, tartaric, and succinic. We have daily proofs that the teeth, in the living subject, are greatly injured by the frequent or habitual use of several of these acids.† I have at this moment a lady under my care, who till of late possessed as sound and fine a set of teeth as can anywhere be boasted of. From a peculiar delicacy of constitution, however, it has been judged requisite that she should, among other medicines, use a very large quantity of sulphuric acid. This prescription has been continued for many months, and her general health is considerably established: but, owing to her not having taken all the precaution that is requisite to guard the teeth while swallowing the acid, the pearly enamel is becoming yellow, and its coating very considerably diminished in thickness, so that at the apex of the incisors it is almost as thin as a razor, and is frequently chipping off.

Sugar can have very little effect in destroying the enamel of a tooth; for, though it contains a principle of acidity, it cannot with propriety be regarded as an acid. It may give forth this principle by fermentation, in which case it will form acetous acid; or it may give forth the same principle by distillation with nitric acid, when it will form genuine oxalic acid (for that which exists already formed in the *oxalis acetosella*, or wood-sorrel, is precisely of the same kind); and, in this combination, will evince a stronger attraction for lime than any other acid whatever. But of itself, and without this combination, we have no reason to suppose that its action, if there be action at all, can be otherwise than extremely weak. [General de Beaufort ate a pound of sugar every day for forty years, and lived to the age of seventy. After death his teeth were found to be quite sound.—(*Anecdotes de Médicine*, tom. ii., p. 35.) Plenck kept a healthy tooth in some diluted syrup two months, at the end of which time it had undergone no change.]—(*Doctrina de Morb. Dentium*, p. 52.) If sugar were a solvent of calcareous matter of any kind, it would first show itself in dissolving, and consequently preventing a lodgment of the carbonate or phosphate of lime, which the salivary glands are so continually secreting, and which is perpetually incrusting on the neck of the teeth in mankind, and separating them from the surrounding gums; and hence sugar would be one of the best preservatives against such an encroachment. But as we do not find that those, who use a large quantity of sugar, are freer from this excrementitious matter than those who abstain from it altogether, we have no reason to suppose that it is a solvent of the enamel of the teeth in any material degree.

It will be well to bear these remarks in memory in the composition of dentifrices containing acids of any kind. For the reasons already assigned, the oxalic, sulphuric, and tartaric acids, ought at all times to be sedulously avoided; and hence cream of tartar, which enters so generally into their composition, should in like manner be rigidly proscribed; while those which have the least chance of doing mischief from their very slight affinity for lime, are the citric, benzoic, acetous, and boracic. Yet even these have a stronger attraction than the carbonic acid; and hence, whenever teeth are deprived of their enamel, or the naked fangs become exposed by a decay of the surrounding gums, these also must in like manner be abstained from.

By whatever means a decay or caries of the teeth may be produced, it appears to operate in three different ways; sometimes commencing in the internal cavity, and working its course outwards; sometimes commencing outwards, and working its course within; and some-

* *Journ. de Méd.*, tom. xxxvii., appendix, p. 399.

† As the fluate and carbonate of lime exist both in the bone and enamel of the tooth, and are even more abundant in the latter than the former part, several acids, besides those specified in the text, must have an injurious effect on the teeth.—ED.

times by a wasting of the enamel, and consequent denudation of the bony part.* The first, which is the least common affection (its reality being denied by several writers), is discoverable bv an appearance of blackness within the whiter surface of the tooth; the third is often to be met with; but the second is the most frequent of the whole; evincing at its commencement the appearance of an opaque white spot through the enamel, which gradually crumbles away about the spot, and thus discloses that part of the body of the tooth which forms the original seat of the affection.

The disease, by its continuance, converts the spot into a hole, and at length destroys the tooth altogether, or at least down to its neck, unless the pain produced by the morbid progress compel the patient to have it extracted before the disease advances thus far.

Caries of the teeth does not appear to be a disease of any particular age, or temperament, or state of health. It exists in infancy and in the firmest manhood, as well as in old age. In the last, indeed, the teeth, that drop out from absorption of their alveoli, are often as sound as when they were first formed; while in childhood, it has sometimes spread from tooth to tooth so extensively, and at the same time produced so much torture, that it has been necessary to extract almost every tooth before the sixth or seventh year. Mr. John Hunter hence conceived, that a decay of the teeth was rather a disease of early, than of advanced life; and that the teeth did not become carious after fifty years of age. Mr. Fox, however, met with several persons, who had not only passed fifty years without having had a caries in this organ, but who had been obliged, after having arrived at sixty, to have several teeth extracted, in consequence of toothache, produced by caries. In some general diseases of the constitution, the teeth seem to possess singular perfection, and even luxuriance. Thus, in phthisis, it is almost a proverbial remark, that the white and pearly gloss of the enamel, which is peculiarly characteristic of soundness, is more than ordinarily clear and bright; while in rickets, in which the whole frame of the bones is shaken, and many of them become soft and spongy, the teeth ascend as firmly and as regularly as if the system were in a state of the most vigorous health.

If the teeth be vascular, there is no great difficulty in conceiving that, like other bones, they may be subject to EXOSTOSIS, or a deposite of ossific matter on their surface, and particularly on the surface of their roots or fangs; [a case, which the non-believers in the vascularity of the teeth ascribe to original malformation. What is called an exostosis of the fang, exhibits no irregularities on its surface, as other exostoses usually do; nor is its substance at all different from the rest of the fang. It is, in short, merely an accidental difference of form, where, as the offices of the part require no definite figure, variations in shape are quite common.] The author conceives, however, that, whether the crown or body of the teeth be possessed of secernents in a mature state, they must have absorbents, since we behold their fangs, in very numerous instances, diminished, shortened, and truncated, and sometimes entirely carried away, which it is difficult to conceive can be done by the absorbents of any adjoining organ. And we may lay it down as a general rule, that there is no organ in possession of absorbent vessels, which does not at the same time possess secernents, so as to maintain a balance of action. We find, on extracting a tooth that has long been a cause of considerable pain, that the fangs at least are considerably incrusted with a deposite of ossific matter, so as to give it an appearance of that disease which was formerly but most incorrectly denominated a spina ventosa. And on examining the state of the alveoli after death, we find also that similar morbid apophyses have pullulated occasionally from the face of the alveoli.

Wherever such effects occur, whether in the alveoli or the teeth, a considerable degree of pain, and generally an increasing degree, must be the result, from the pressure of the bony projections against the periosteum or alveolar membrane. At first, this pain is not quite so acute as in carious or nervous toothache, for the imprisoned tunic is not at this time in a state of irritation. But, by a continuance of the pressure, it is soon reduced to this state, when the pain will be as severe as on any other occasion, and far less mitigable.

Wherever we can satisfactorily decide upon the cause, and the complaint is recent, we may often put a check to it by a free application of leeches, and the local use of mercurial ointment, or a mercurial plaster. But in cases of long standing, the only cure is an extraction of the tooth; for even if the disease be seated in the socket, it will be instantly arrested by this process, as the substance of the socket, no longer of any use, will from this time be in a state of absorption, and be at length entirely removed.

There is sometimes a PECULIAR IRRITABILITY IN THE NERVES OF THE TEETH themselves, or of those parts by which they are immediately surrounded, and with which they participate in action, that excites the sensation of severe and even agonizing toothache, without caries or any other concomitant. In this variety, the exact seat of pain is less easily defined than in the preceding; and, there being no black spot or other external mark to direct us to it, the tooth is often mistaken in the continuous sympathy excited, and a sound tooth is extracted in its stead; so that the torture remains unabated. And there are instances, in which the plan of extraction has been followed up from tooth to

* On this subject, Mr. Parmly, an eminent dentist of New-York, remarks, "I consider the immediate and exciting cause of dental decay to be always external to the tooth itself, and to consist of certain corrosive menstrua, to which these organs are exposed from bodily disease, improper aliments, powerful medicines, and the thousand other sources of acrid filth and destructive poisons, that become concentrated in the mouth and deposited on the teeth."—*Notes to Brown's Dentologia.* New-York, 1833.—D

tooth without any alleviation whatever, till the jaw has been entirely divested of its teeth on the disordered side.

This is often an idiopathic affection, dependant upon a peculiar irritability, from a cause we cannot easily trace, of the nerves subservient to the aching tooth, or the tunics by which it is covered, or the periosteum, or the fine membrane that lines the interior of the alveoli. But it is more frequently a disease of sympathy, produced by pregnancy, or chronic rheumatism, or disorder of the stomach, in persons of an irritable habit. For this remote or indirect influence it is not difficult to account, when we reflect that the great intercostal nerve, emphatically called the sympathetic, and connected by ramifications with every viscus of the chest and lower belly, is connected also, by its union with a branch of the fifth pair, with the nerves that immediately supply the teeth, and which hence become its indirect extremities.

It is still less to be wondered at that the nerves of the teeth should often associate in the maddening pain of *neuralgia faciei*, or tic douloureux; for here the connexion is both direct and immediate. In consequence of this, the patient, in most instances, regards the teeth themselves as the salient point of pain (and they may unquestionably be so in some cases), and rests his only hope of relief upon extraction, although, when he has applied to the operator, he is at a loss to fix upon any one tooth in particular. Mr. Fox gives a striking example of this in a person from whom he extirpated a stump, which afforded little or no relief; in consequence of which his patient applied to him only two days afterward, and requested the removal of several adjoining teeth, which were perfectly sound. This he objected to; and, suspecting the real nature of the disease, he immediately took him to Sir Astley Cooper, who, by dividing the affected nerve, produced a radical cure in a few days.

Where the pain, therefore, proceeds from sympathy, it is of the utmost importance to trace it home to the organ idiopathically affected, for to this the attention should be chiefly directed. Where it exists as a primary disease, it is often of long duration, and difficult removal. Sometimes narcotics, and sometimes stimulants, have been found most successful: blisters have occasionally relieved; and the burning of a little cone of moxa behind the ear, more frequently and more effectually. Of narcotics applied locally, hyoscyamus appears to be one of the best. Its seeds may be put to the cheek in the form of a cataplasm; or their smoke conveyed by a funnel to the tooth itself. In this last form, it will often allay the pain of a carious tooth. Where the pain is remittent or periodical, a free use of bark, with change of air, has proved most salutary.

[From the preceding observations it appears that the author of the present work joins those physiologists who regard the teeth as vascular, and he even carried this belief so far as to express a suspicion, that these organs sometimes undergo an increase of size, whereby the interspace produced between two of them, by the extraction of one, may be considerably lessened. In a former edition of this book, he mentioned the fact as having occurred in his own jaw, after the removal of one of the bicuspidati, when he was a boy. That the teeth frequently approach each other, so as to lessen, and even nearly fill up, the interspace occasioned by the extraction of one of them, is an undoubted truth; but the correct explanation of its cause is not the enlargement of the teeth, but the change that follows in the situation of the socket. Hence when a tooth is removed from a young subject, whose jaw is yet growing, the interspace may become in time nearly obliterated. If the gap were filled up by the expansion of the adjoining teeth, this could only happen from the enlargement of the crowns; but though specimens of exostoses and swellings of the fangs of teeth are contained in museums, the editor has never yet met with a tooth, whose crown or body was enlarged.

The question, whether the teeth are vascular, is extremely curious and interesting; and so unnatural is the idea of an harmonious connexion between dead and living substances, that the common opinion of the teeth being furnished with vessels and nerves, is not at all surprising. Nay, the excessive pain often seated in these organs, and the remote, diversified, and very severe disorders, which they appear to excite sympathetically in the animal economy, are circumstances presenting something like a confirmation of the doctrine. Nor can it be denied, that much difficulty occurs in accounting for certain changes in the teeth, unless this doctrine be admitted. But it is not because we cannot explain precisely the nature of every particular alteration or appearance of these organs, without supposing them to be vascular, that they must really be so; for, if some of the phenomena in question take place also in artificial teeth, and in teeth which have been boiled, or kept so long in a drawer as not to admit of the suspicion of their being alive, the doctrine then immediately becomes a questionable hypothesis.

The difficulty of accounting for caries of the teeth, and for the absorption of their fangs, unless the belief in the vascularity of these organs be adopted, seems to have had great influence in determining the author of the "Study of Medicine" to consider the substance of the teeth as vascular. That he was also correct in his notice of the disagreement between Mr Hunter's Natural History of the Human Teeth and the Essay on their Diseases by the same distinguished man, is a truth, of which no person who has read these works can doubt. The subject was difficult,—so difficult as even to involve Hunter in hesitation, if not contradiction. Our author has not mentioned, however, some of the principal facts and arguments which such modern physiologists as disbelieve the vascularity of the teeth generally bring forward: a short account of them in this place may not, therefore, be uninteresting.

In the second edition of this work, it was re

marked by the author, that, "admitting the soundness of Mr. Hunter's experiments, and the accuracy of his reasoning, it seems impossible that the teeth, when once perfectly produced in the gums, should ever decay; for no action of the living principle can occasion a secretion of those chymical agents which would alone, in such case, be capable of destroying them." We have seen, also, that our author describes one form of caries as beginning within the tooth. Others, however, deny the reality of the latter case, and, if they are right, the answer is at once given to the foregoing argument. They distinctly allege that caries never begins within the tooth; but a speck is first seen upon the enamel, a portion of which being destroyed, the decay extends to the bone of the tooth, and proceeds from the surface into the cavity. As soon as the bone begins to be affected, the progress of the decay is much more rapid; an excavation is produced; and the enamel is left in the form of a hollow shell. The following considerations are mentioned as proofs, that the decay is not the effect of vascular action. It first attacks the enamel, which is confessedly not vascular; for though Bichat regarded this substance as sensible and organized, because acids set the teeth on edge, the fact is, that the disagreeable sensation, here adverted to, is not situated in the enamel itself, nor is it ever excited by an acid merely applied to it. The acid must at the same time come into contact with the organ of taste, or extend its action directly to the sensible parts within the cavity of the tooth.

Throughout the whole process of caries, there is no attempt at reparation. Artificial teeth are as much subject to decay as natural ones. The discoloration has, indeed, been sometimes thought to be more deep in the artificial teeth made of the tooth of the hippopotamus, than in the human teeth; but, in ingrafted human teeth, the decay is acknowledged to be precisely similar to that of the natural ones.

The alleviation of toothache by the application of muriatic acid, nitrate of silver, and other caustics to the carious surface, has been esteemed a proof that the caries is an ulcer, and that its irritability may be destroyed by such treatment. Since, however, the remedies may act upon the exposed vascular contents of the cavity of the tooth, or may affect these contents by penetrating through the thin medium which remains, it is manifest that they can afford no proof of the point in question. At the same time, it is to be taken into the account, that toothache from caries may frequently be relieved by a plan nearly amounting to a demonstration, that the pain does not arise from the ulcerated surface, but from the nerves in the cavity; namely, let the decayed hole be stopped up (which is rather a rude method of treating an irritable ulcer), so as to prevent the access of the external air and of foreign bodies, and the pain will cease.

The writer, from whom the editor has borrowed these judicious reflections, further observes, that it is not perhaps so easy to determine what the decay is, as what it is not. Those who consider the teeth as destitute of vessels, ascribe their decay to the chymical action of the secretions in the mouth, and of the articles of food. Here it is difficult to comprehend how a cause which must necessarily be so general in its application, should be so circumscribed in its effects; never producing decay at once in an extensive surface, but in its commencement, limiting its action to a small spot. However, in artificial teeth, a large surface sometimes decays under circumstances favouring an accumulation of fluids in a particular part; viz., the portion that corresponds to the gum, and is usually grooved, and also the lateral parts of such teeth.

Various considerations strengthen the inference, that the decay of the natural teeth must depend upon a chymical and not a vascular operation. It commences in those situations where food or extraneous matters are most liable to lodge, as between the teeth, and near the neck, just where the gum adheres. It is checked by stopping up the hole, and preventing the entrance of the food and secretions of the mouth into it. It is most frequent in the higher classes of society, whose food is of the most unnatural and miscellaneous kind. It is very rare in the teeth of savages, and it is alleged never to occur in animals. In twelve or fourteen sculls, discovered in two barrows opened in Gloucestershire, not a single decayed tooth was noticed. Now, as this mode of burial has not been employed for the last six centuries, these sculls must have belonged to a time when the modern habits of luxury, in respect to food, were unknown; and when the effects of such habits on the teeth were, of course, not discernible. One fact connected with the foregoing statements, and perhaps in some degree throwing a doubt on part of them, is the extraordinary prevalence of caries of the teeth in particular families, seemingly as if there were some original hereditary imperfection in them, whereby the causes of caries, whatever they may be, very readily produce their destructive effects. Another fact, universally acknowledged, is the frequent and almost regular occurrence of fine sets of teeth in certain families through a long series of years; a circumstance that seems, like the preceding one, to imply some hereditary differences in the degree of perfection of these organs. That persons who smoke tobacco generally have discoloured, carious teeth, is a fact universally recorded. Perhaps, therefore, the ingenious author of the present work was mistaken in supposing, that the production of caries of the teeth could not be chymically accounted for, unless the secretion of chymical agents within them were admitted as a fact, which fact would, of course, imply vascularity. The caries, instead of beginning sometimes internally, as he supposed, always commences externally in the enamel, and proceeds from it into the bone of the tooth, so that the fluids, and other matters in the mouth, have direct access to the affected surface. An inward decay of the teeth, with the whole shell of enamel perfect, is talked

of by dentists; but, though the external aperture may be minute and concealed, its existence must not be denied, until a contrary case can be fully demonstrated.

Our author supposed that madder and anatomical injections might not be sufficiently attenuate to enter the vessels of the teeth, and was not disposed to receive the fact of those substances not entering them as a proof of their non-existence. Certainly, in several instances, to conclude that parts are not vascular, because the vessels cannot be injected, would be decidedly erroneous. But in these particular cases, the phenomena of disease enlighten us and correct our judgment; which can hardly be said to occur with respect to the teeth, for their changes, whether vital or chymical, are enveloped in the deepest mystery. As for the experiments with madder, however, they furnish the strongest argument of all against the vascularity of the fully formed substance of the teeth, without even affording the least room for the argument, that madder is not subtile enough to enter the vessels of those organs. This will be immediately evident, when it is recollected, that while the tooth of a young animal is only partly formed, if madder be given with the food, it is really transmitted by the vessels of the pulp, not indeed to the portion of the tooth already complete and void of vessels, but to that part of the organ which is developed subsequently to the beginning of the experiment, and is the work of the vessels of the pulp. Here, however, a most interesting fact was pointed out by Mr. Hunter; namely, that when the tooth of a young animal has thus been tinged with madder, the stain is never afterward removed, which is exactly the reverse of what occurs in bones died by feeding animals with the same substance. The bones, therefore, must have vessels for the conveyance of the madder into them, and other vessels by which it is again removed from them. On the other hand, though the vessels of the pulp seem capable of communicating the red tinge of madder to the bone of the tooth upon its first deposition, they appear directly afterward to have no further communication with the new formation, which remains incapable of every change usually produced in other parts through the medium of arteries, veins, and absorbents.

These conclusions, deduced from experiments with madder, may be set down as firmly established, without being at all weakened by an observation made by the late Mr. Gibson; namely, that the fact of the power of madder to redden the bones is no demonstration, that a continual renovation of their particles takes place.—(*Mem. of the Lit. Soc. of Manchester*, 2d *series*, vol. i., p. 146.) Madder communicates to the bones a red tinge, which is afterward gradually removed: these two facts prove, at all events, an interstitial action, as far as that substance is concerned, and thus are explicable only on the principles of vascularity and life. Just so the communication of a red tinge by madder to the phosphate of lime of a tooth that is undergoing development, is a tolerably convincing proof, that vessels then deposite both the earthy and the colouring matter; while the permanency of the tinge as clearly shows, that the coloured particles of lime in the tooth are not absorbed again, and that no vascular interstitial changes afterward occur.

In confirmation of the preceding view, it deserves particular notice, that the teeth never exhibit any appearances of reparation under circumstances of accidental injury or supposed disease. The loss of substance occasioned by the friction of mastication is not repaired; a part broken off is not renewed, but the fractured surface remains unchanged; a hole caused by decay is never filled up again. The union of a fracture near the neck of a tooth, even if it be possible, as M. Duval* and others declare, does not at all invalidate the foregoing statement, because the union is ascribed to the action of the pulp, and not to that of vessels within the substance of the tooth itself.

The non-existence of vessels in the teeth may be inferred from another particular case; a violent blow sometimes causes a general discoloration of a tooth, as if blood were effused through all its texture. This appearance is explicable, either by supposing vessels to exist in the substance of the tooth, which pour out the blood in consequence of the injury, or by supposing that the vessel in the fang is ruptured, and that the extravasated blood mechanically discolours the substance of the tooth. If the former explanation be adopted, the colour ought not to be permanent; for wherever there are arteries, there must also be absorbents; and these ought to remove the effused blood, as they do in bruises of the soft parts. By the other explanation we gain a satisfactory solution of the difficulty; we account for the duration of the colour in the tooth in the same manner as of that which arises from feeding a young animal with madder.

The teeth are exempted from all those diseases which ravage the bones:† lues venerea, scrofula, and rickets, which attack all other bones, never produce the slightest effect on the teeth, which remain unaffected even in cases of *mollities ossium*, where all the other earthy matter of the system is absorbed.‡ In short,

* Dict. des Sciences Méd., tom. viii., p. 335.

† This assertion is too unqualified. The influence of constitutional causes, even of adventitious origin, and the effects of hereditary peculiarities, on the healthy or disordered condition of the teeth, may frequently be observed. The teeth of scrofulous persons, and the detrimental effects of the abuse of mercury on the teeth of some individuals, have been remarked by many writers. In mollities ossium, the teeth sometimes participate. A case of this is stated by Veirac, Abhandlung über die Rhachitis, pp. 54, 83.—Stendal, 1794. See, also, Isenflam, Versuch einger prakt. An merkungen über die Knochen, p. 427. A tooth resembling cartilage was found by Krauss in Misc. Acad. N. Cur., 1697, p. 619. In the museum of Blumenbach is the back tooth of an animal, which, excepting the root, has completely expanded into a large bony tumour. Meckel has figured a similar case of a human tooth, tab. 7, figs. 8, 10.—D.

‡ The museum at Leipsic, it is said, contains

the teeth never have the slightest participation in the general affections of the constitution. Their substance also never swells from inflammation; it never throws out a fungus or exostosis; for what has received this name is in all probability an original malformation, as Mr. Hunter first suggested.* Ossific depositions may be conceived to arise from the vessels of the pulp, or those of the membranous lining of the fang, so as to lessen, or even obliterate, the cavity or canal; a change said to happen in old age, without supposing any part of the change to result from vessels in the substance of the bone. The same substance never exfoliates. Whole teeth are sometimes included in an exfoliated portion of the jaw; but then they are not altered in structure or appearance, which is another proof of their want of vascular connexion with the rest of the body. If, says a well-informed writer, it be said that these teeth are dead, like the bone which contains them, we would ask, what are the distinctions in appearance between a dead and a living tooth? Are they to be ascertained by inspection in the living body, or can they even be demonstrated by anatomical investigation? The absorption of the fangs of the temporary teeth cuts off the vessels long before these teeth are actually shed; yet there is no sign nor character by which a tooth whose vascular supply is thus intercepted, can be distinguished from another in which it remains unimpaired.—(*Rees's Cyclopædia*, art. Cranium.)

As is remarked by the same author, the difference between the growth of the teeth and that of the bones is particularly striking. In the cartilaginous epiphysis of a young bone, vessels are seen entering from all sides; in the centre there is a small bit of bone, of a loose and spongy texture, which can be made quite red by injection. We can trace this hardening through every intermediate stage, to that of perfect bone, the vessels of which, even in its most compact state, are still easily demonstrable. Let us compare with this the growth of a tooth. If we examine it at ever so early a period, when a speck of ossification only can be discerned, the part which is thus formed is complete, and has all the properties which belong to the bone of the perfect tooth. It does not undergo that gradual development which is seen in the growth of bones; but the smallest point, when once formed, never alters. In cartilaginous epiphyses, the central portion of bone is imbedded in the cartilage: numerous vessels can be traced into it on every side; while in a tooth, the ossification does not go on in the centre of the pulp, but the bone covers it like a shell. The connexion between them is merely that of contact of surface, and there is no discoverable vascular union.

If any argument be drawn in favour of the vascularity of the teeth, from the fact of blood being sent into their cavity, it must be immediately weakened by the reflection that the intention of various other arrangements in the structure of the body is completely mysterious. Thus, we know as little why male animals have mammæ and nipples, as why the cavity of a tooth should contain vessels apparently for no purpose.

With respect to the circumstance of a yellow colour being communicated to the bone of the teeth in jaundice, it is no proof of their vascularity. As is well remarked, the argument would prove too much. The vessels of the teeth, if any such exist, are so minute that they neither convey red blood nor coloured injection; yet they are capable of carrying so much bile as to tinge the tooth of a uniform yellow to a certain distance from the cavity. If this colour be then owing to a yellow fluid contained in vessels, these must be so numerous as to render the tooth much more vascular than any other bone. The fact is, that the vessels of the pulp contain bile, and die this part of a uniform yellow colour, which is mechanically imparted to the adjacent bone in the neighbourhood of the cavity; the effect gradually ceasing at a little distance from it. The stain is produced, just as it is by immersing the teeth in bile after death.

Another proof of the vascularity of the teeth, is attempted to be taken from their successful transplantation from the jaw of one person to that of another, or to parts of another animal's body, as the comb of a cock. These experiments, however, will succeed with dead teeth. The writer of the article Cranium, in Rees's Cyclopædia, was shown a cock, in whose comb the late Mr. Moor, the dentist, had inserted a tooth that had previously lain many months in a drawer; and it was firmly adherent. This adhesion then does not seem to require even the living principle, of which it was regarded by Mr. Hunter as a proof.

But no arguments have been more confidently employed by the believers in the vascularity of the teeth, than those deduced from comparative anatomy. Animals of the class glires, as the beaver, hare, rabbit, squirrel, rat, mouse, &c., have two very large incisor teeth in each jaw, which, being employed in cutting various hard bodies, wear down very rapidly. Hence, if these animals be kept entirely on soft food, their teeth grow out to a great length, and sometimes assume very ludicrous shapes: and if these teeth be lost from one jaw, the opposite

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examples of anchylosis of the teeth with the jaw, taken from rachitic subjects, and likewise other preparations illustrative of the fragility of the teeth in individuals of a similar constitution.—(Cyc. of Pract. Med., art Dentition.) But it appears to me that as fragility of the teeth is by no means common in rachitic patients, and is sometimes observed in other persons, it can hardly be regarded as an unequivocal effect of rickets.—Ed.

* Soemmerring and Fox each saw a case where several of the teeth were consolidated into one mass; and Dr. Joy met with a similar instance in the museum at Leipsic, of two incisors grown together by their crowns, while the roots were separated. These abnormal appearances he refers to the deficient evolution of the alveolar septa.—(Cyclop. of Pract. Med., art. Dentition.) In speaking of Odontia Deformis, we shall introduce some other explanations of this point.—Ed.

ones grow out in the same way.* This constant growth is effected in the same manner as their original formation. They are hollow, and contain a pulp, which continues to deposite fresh substance below, in proportion as their upper part wears away. The tusks of the elephant and hippopotamus have a similar power of growth. It seems now, indeed, to be the common belief of some of the first physiologists, that the teeth really present a strong analogy in their development to the hair, nails, and horns of the animal body, and also, as M. Geoffroy St. Hilaire has fully ascertained, to the beaks of birds. In the human subject, the process by which the teeth are formed confirms this doctrine; but, as we have noticed, what happens in the incisor teeth of the gnawing animals is a still closer analogy, since the pulp retains for an indefinite period the power of secreting additional matter, by which the effects of the loss of the tooth at its cutting end are counteracted, and an incessant tendency to elongation, or growth, kept up in the organ. A list of distinguished authorities, and a brief notice of some of the arguments in support of this physiological view of the nature of the teeth, are given by Meckel.†

Bullets have been found imbedded in the tusks of elephants. Now, the advocates for the vascularity of the teeth have argued that the closure of the opening, by which the ball entered the tusk, and the swelling sometimes observed in these cases opposite the foreign body, could not have taken place without the agency of vessels. However, these occurrences are now satisfactorily explained, without having recourse to this hypothesis. The tusks are constantly growing, during the animal's life, by a deposition of successive laminæ within the cavity, while the outer surface and the point are gradually worn away; and for this purpose the cavity is filled with a vascular pulp, similar to that in which the teeth are originally formed. If a ball penetrate the side of a tusk, cross its cavity, and lodge on the opposite side, it will become covered towards the cavity by the newly-deposited layers of ivory, while no opening will exist between it and the surface, to account for its entrance.* All the various appearances attending the lodgment of bullets and pieces of other weapons in the tusks of elephants, can be accounted for by the power of the pulp connected with these organs.

The absorption of the fangs of teeth is no proof of absorbents in them,—the fact only showing that those parts are capable of being acted upon by the organs of absorption, which may be situated in the alveoli, or in the cavities of the fangs, without being actually in the substance of the bone of the tooth.]

* This remarkable growth is sometimes the consequence of a mere change in the direction of the teeth, without any of them being absent. In the head of an old rat, presented to the Royal Academy of Medicine, Andral noticed the following disposition of the incisors:—The upper right incisor had scarcely shown itself out of its socket, when it inclined obliquely downwards and backwards into the mouth; and, having reached the posterior opening of the nasal fossæ, it turned upwards and entered the left cavity of the nose. After reaching the nostril, it next perforated the upper jawbone, insinuating itself into the socket of the adjoining incisor tooth, and now changing its course again, terminated in a point below the left orbit. The two incisors of the lower jaw were also curiously lengthened and twisted; and one of them, after passing close to the left eye, which it had destroyed, came in contact with the scull, and seemed ready to pierce it. Anat. Pathol., t. ii., p. 266.—ED.

† Anat., vol. iii., p. 234. See also Mém. sur l'Accroissement continué et la Réproduction des Dents chez les Lapins, &c., par M. Oudet, in Magendie's Journ. de Physiol., tom. iii. et iv.

SPECIES III.
ODONTIA STUPORIS.
TOOTH-EDGE.

TINGLING UNEASINESS OF THE TEETH FROM GRATING SOUNDS, OR FRICTIONS.

THERE is sometimes a peculiar sensibility in the teeth or their sheaths, that induces a kind of vibratory pain, in which they are colloquially said to be SET ON EDGE; and that in two ways as follows:—

α A stridore.	From jarring noises.
β Ab acritudine.	From vellicative or acrid substances.

In many cases the teeth sympathize with the ear, on an exposure to harsh, dissonant, or stridulous sounds, as the grating of a file, the creaking of a door on its hinges, or of a swinging sign in the street.

The same effect is produced whenever the teeth are vellicated by smooth substances, as a piece of silk or velvet, or exasperated by acid or other acrid materials.

To explain these effects, it is necessary to observe in the first place, that a close reciprocity of feeling is at all times maintained between the teeth and the tympanum of the ear, by a union of their respective nerves; as one of the branches of the seventh pair, destined to supply the tympanum, anastomoses with the lingual branch of the fifth, which sends offsets to the teeth: by which means the latter become indirectly an organ of sounds, as well as of mastication. It is for this reason, among others, that deaf persons open their mouths to catch up speech they cannot otherwise hear; and that, as already observed, when the wise or adult teeth are about to be cut, the tympanum not unfrequently endures more pain than the gum or membrane by which the tooth is covered; and hence, the tuner of a musical instrument is often in the habit of applying his tuning-pipe to his teeth, as soon as he has put it into a state of vibration, to determine the more accurately upon its pitch.

Now, as the last action is a source of pleasure to the teeth, from the vibrating tone proving agreeable to the ear, we can readily see why tones or sounds of any kind that are hateful to the ear, should be hateful also to the teeth.

* See Rees's Cyclopædia, art. CRANIUM.

This is the general principle: and it is sufficient to explain why all persons are in a certain degree subject to the tooth-edge, upon an exposure to the more common causes that produce it. But in constitutions of a peculiar kind, or where the ordinary association between the two organs has been specially and habitually cultivated, or some early and very powerful impression has been even accidentally communicated from the one to the other, the sensation of tooth-edge will be produced far more frequently and acutely than in other cases. And when, in such persons, the teeth are in a state of preternatural sensibility from any kind of diseased action, or from irritating substances applied to them and the gums, as acerb or acid juices, the sensation may become so acute as to be intolerable. Bartholine (Epist. IV., p. 523) has recorded a case, in which the sharpening of a knife so highly excited not the teeth only, but the surrounding gum, that, along with a very sensible jarring of the teeth, a profuse hemorrhage from the gum was occasioned.

In many instances, the power of the imagination alone, from a long habit of association, is sufficient to call up a very considerable degree of this painful feeling;* as when we see a knife drawn across a china plate, though so gently as to produce no sound whatever; and there are instances of persons in a high degree of excitement, who, by this action alone, have been suddenly thrown into convulsions.

While this affection is permanent, or very frequent and troublesome, and proceeds from a morbid state of the teeth or their involucres, our attention must be particularly directed to the nature of the cause with a view to its removal: if the gums be inflamed, spongy, or otherwise irritable, scarification will often be found serviceable: and if the disease be seated in the body of the teeth, several of the remedies recommended under the preceding species, may have an equally good effect in the present case. If it be a symptom of some other complaint, it can only be removed by a removal of the original disorder. Forestus (Lib. xiv., Obs. 9), Baricelli (*Hortus Genialis*, p. 337), and others, assert, that relief may often be obtained by chewing purslane leaves. When it is the mere result of an association of ideas, or of great strength of sympathy, with an ear delicately alive to harmony of sounds, it is best cured by an habitual exposure to the cause of the affection, which gradually blunts the feeling. The grating sound produced by filing a saw, was probably at one time harsh and abhorrent to the ears of the sawyer; but, by being inured to it, he at length hears it with indifference.

* Darwin, Zoonom., sec. xvi. 10. & cl. iv. 1, 2, 3.

SPECIES IV.

ODONTIA DEFORMIS.

DEFORMITY OF THE TEETH.

TEETH IRREGULAR IN SHAPE, POSITION, OR NUMBER.

DEFORMITIES of the teeth are for the most part produced naturally and in early life. Either set may be too large or too small, or some of them much larger or smaller than the rest, or they may be irregular in their line of ascent. They may be misplaced by incurvation, or projection, or obliquity. They may be crowded and confused, or, as has sometimes occurred, be multiplied in crops of double or triple rows.* In all these cases, they cannot too soon become a subject of artificial arrangement, which in young persons may accomplish much, and often, by skilful management, not only correct the error of shape or number, but give a proper inclination, not merely to the teeth, as they start from their natural line, but even to the misshapen sockets.

Many of these irregularities proceed from a natural excess or deficiency of the calcareous matter which enters into the structure of the teeth. This has been sometimes so defective as to leave the teeth cartilaginous, or possessed of their animal part alone: and, in a few cases, as I have already observed, to retard the appearance of even the first set till ten or twelve years of age. [Plenck extracted from a girl, seven years of age, a canine milk-tooth of the lower jaw, which was livid, as soft as cartilage, and compressible by the fingers, especially at the fang.]† But the opposite extreme is by far the most frequent; and where this exists in a considerable degree, we not only find occasionally all the irregularities already noticed as resulting from plurality, but sometimes inseparable union between the teeth and their sockets, so that it is impossible to extract them without fracturing the sockets; sometimes a perfect continuity or coalition between all the teeth,‡ insomuch that, in one instance, the whole was found to constitute a single bone or curb of ivory.§ Then again, we sometimes meet with a production of teeth in other parts of the mouth than the gums, and particularly in the palate, of which examples are to be found in Schenck‖ and Borelli.¶ Albinus records an instance, in

* Bloch, Medicinische Bemerkungen, p. 19. For others, see Nosolog. in loc.

† De Morb. Dentium, p. 39.

‡ Bartholin. Hist. Anat. Sent. i. hist. 35. Henckel, Sammlung Med. und Chir. Anmerkungen, vii. N. 16.

§ Schenck, lib. i., Obs. 412. Andral, Anat. Pathol., t. ii., p. 262.

‖ Schenck, lib. i., Obs. 411.

¶ Cent. ii., Obs. 81. The supernumerary teeth, which are formed independently of the regular ones, may be in the same line with them, though this is rare. Thus, Soemmerring saw five incisors in the upper jaw. Meckel mentions one instance, in which a rickety girl, fifteen years of age, had small bony points, resembling denticulations of fish, interposed between the regular teeth; and Tesmer met with an individual, whose upper jaw contained four supernumerary molar teeth, arranged in the same line with the others; three on the right side, and one on the left. In general, supernumerary teeth are not in the same line with the rest: they may be directly behind the incisors, or scattered over the roof of the mouth. Sandifort recites a case, in which there were thirty-six teeth in each jaw. Supernumerary teeth are more frequently noticed in the upper jaw than the lower;

which a canine tooth grew in the substance of the nasal process of the jawbone below the orbit.*

Another cause of irregularity in the ascent of the permanent teeth is an inaccordance of time or manner, in the absorption of the fangs of the first set of teeth, and the protrusion of those of the second set. As the latter fangs are thrown forth, the former, in all cases of regularity, are carried away: and hence the permanent teeth, pressed forward by the gradual prolongation of their fangs, bear before them the mere crowns of the shedding-teeth, and find little resistance to their ascent. In former editions, the author referred to these circumstances in proof of the vascularity of the teeth; observing that, as the fangs pullulate from the bodies of the teeth, the latter parts must have vessels. The truth is, however, that the fangs are formed from the vessels of the prolongations of the pulp.] Now, if the fangs of the upper set be not sufficiently carried off, or, in other words, the crown of the teeth be not sufficiently detached and set at liberty, as the under set, or any particular teeth in the under set, press forward, the latter must necessarily be thrown out of their proper line, and rise within, or without, or wherever they can force their way.

The second set of teeth is also wider than the first; and hence, with the exception of the bicuspidati, which from this very circumstance rise under the shedding molares, every single tooth in its ascent must be opposed to more than a single tooth above it; whence another source of difficulty, and often of irregularity. In consequence of all which, it is rather to be wondered at, that we do not meet with more frequent instances of deranged or misshapen teeth than actually occur to us. And nothing can be clearer, than the necessity of a close and skilful watch over them during the shedding season, so as to remove any of the first set when they form an undue degree of resistance to the permanent, and have a tendency to throw them out of their proper line; and any of the second set that may exceed their proper number, and, by their surplus, crowd and misplace the rest.

and the cutting and canine teeth are more commonly redundant than the molar.—See Andral, Anat. Pathol., t. ii., p. 263.—ED.

* Annot. Acad., tom. i., p. 54. The reference of these various cases simply to redundance of calcareous matter, is not altogether satisfactory, inasmuch as no redundant tooth can be formed without some peculiarity in the pulp. An extraordinary number of teeth may occur under three circumstances: the milk-teeth may not drop out in proportion as the permanent ones rise; 2dly, true supernumerary teeth may be formed; 3dly, a second development of the same tooth may take place. The first case requires no comment; in the second, there may be either an aggregation of several germs, and the supernumerary teeth united to the regular one; or these may be completely separated from it; or a prolongation may be sent off from the regular tooth, giving it the appearance of being double.—See Andral, Anat. Pathol., t. ii., p. 263.—ED.

SPECIES V.
ODONTIA EDENTULA.
TOOTHLESSNESS.

LOSS OR WANT OF TEETH.

THIS is also a very common affection, and offers the following varieties:—

α Peculiaris.	From constitutional defect.
β A vi extrinseca.	From external violence.
γ A carie.	From decay.
δ Senilium.	From old age.

As the teeth are often produced supernumerously, so are they often naturally deficient in number. [Sometimes the germs of the permanent teeth are either wanting, or are not developed, and then the milk-teeth are in certain instances not shed during life, but merely diminish in size from the effect of a larger attrition than what they were designed to bear. In other cases the milk-teeth are shed as usual, but not replaced. Lastly, examples occur, in which no teeth whatever are produced, and individuals have been known to reach a very advanced age, without ever having had a tooth in their mouths. If the edge of the jaws of persons thus circumstanced be examined, it will be found to be of a fibro-cartilaginous consistence, like the hard substance noticed in infants which have not yet cut their teeth; or like what is reproduced in old persons, or that which always exists in ruminant animals in the places where their jaws are naturally destitute of teeth.—(*Andral, Anat. Pathol.*, t. ii., p. 261.) But, the absence of teeth in man may be only partial; and, in this case, there is a difference in the frequency of the defect in relation to the kinds of teeth.] The dentes sapientiæ, which are the last cut, are those which are most frequently not produced at all; however, there is hardly any particular tooth that has not sometimes failed in its development. This is sometimes the case with the bicuspidati, as it is not uncommon to meet with a person in whom one, two, or more of these, have never made their appearance. But it occurs more frequently in the incisors, particularly of the lower jaw: and Mr. Fox refers to an instance, in which this defect appertained to several individuals of the same family, none of whom had ever cut these incisors. [In one example on record, there were only four permanent teeth in each jaw, and in another, only a single incisor in the upper jaw.]—(*Fox on the Teeth. Sabatier, Anat.*, tom. i., p. 78.)

But the other varieties of cause are more obvious and common: being

Violence, by which they are suddenly misplaced, or knocked out;

Caries, or inflammation of the surrounding sheaths, by which they become loosened in their sockets; and

The natural absorption of their sockets in advanced life.

In many instances, therefore, the separated teeth are in a sound state; and, in a few instances, where the alveolus is also perfect, and the tooth has only been out of it for an hour or two, so that its living principle has not alto-

gether ceased, it may be replaced, and will take a fresh hold and become serviceable for many years; though it rarely, perhaps never, forms so firm and permanent an attachment as before the accident which threw it out.

Mr. Hunter extended this mode of supply to a transplantation of teeth from other persons: and, at one time, this method also was carried to a considerable extent of practice. Too much caution, however, cannot be employed in ascertaining the health of the individual by whom the scion tooth is to be furnished; for syphilis, and other diseases, may be transplanted at the same time. As an instructive case upon this subject, I may refer to the following, drawn up by Dr. Watson, and inserted in the Medical Transactions.—(Vol. iii. art. xx.) An incisor tooth of the upper jaw, from an unknown cause, becoming carious in a young unmarried lady about twenty-one years of age, it was extracted, and the place very dexterously supplied by a like tooth from another young woman, who, upon examination for the purpose, appeared to be in good health. The scion tooth very rapidly took a firm hold, and soon bid fair to be of great service and ornament. In about a month, however, the mouth became painful, the gums inflamed, discoloured, and ulcerated. The ulceration spread very fast, the gums of the upper jaw were corroded, and the alveoli left bare. Before the end of another month, the ulceration stretched outwardly under the upper lip and nose, and inwardly to the cheeks and throat, which were corroded by large, deep, and fetid sores. The alveoli soon became carious, several of the teeth gradually dropped out, and at length the transplanted tooth, which had hitherto remained firm in its place.

About this time blotches appeared in the face, neck, and various parts of the body, several of which became painful and extensive ulcers; a considerable degree of fever, apparently hectic, was excited; a copious and fetid discharge flowed from the mouth and throat, which impeded sleep; and the soreness of the fauces prevented a sufficiency of nourishment from being swallowed.

The wisest plan would probably have been to have commenced from the first with a mercurial process, before the system had been so far debilitated, and the general health so deeply encroached upon, as to render any plan of very little use. An antiseptic course, however, of bark and other tonics, was first tried and persevered in, till found to be of no service whatever; and calomel pills in an alterative proportion were then had recourse to in their stead. This plan was found to soften every symptom, and totally to eradicate many; but the bowels were soon affected with severe pain and purging; and the calomel was exchanged for strong mercurial ointment; which, from the present debility of the patient, soon produced a like effect, and an effect that could not be corrected by opium; and, in the end, the patient fell a victim to the experiment. The person from whom the tooth had been taken, had, in the meantime, continued in perfect health; and, upon a minute inspection, as well of the sexual organs as of the mouth, evinced not the slightest syphilitic affection.

The case is mysterious, and leaves much ground for the imagination to work upon. If it be difficult to conceive it to have been syphilitic, it is more difficult to conceive it to have been any thing else. But the grand lesson to be learned from it, on the present occasion, is that of the wariest caution, and a caution amounting almost to a prohibition, in remedying a deficiency of teeth by transplantation.

Other cases might be advanced, but it is unnecessary. Mr. Hunter, partial to his own invention, endeavoured to account for most of these upon the principle of local irritation exciting remote evils, or universal sympathy. Yet the cases of mischief have been so severe and numerous, that the practice has long fallen into great disrepute.

A transfer, however, of the mere crowns or bodies of sound teeth, with the fangs filed off, does not seem to have been productive of the same evil effects; and hence these may be conveniently made use of when the body of one or more teeth has been destroyed by caries, while the fangs have remained sound: for, by screwing a piece of gold wire into the crown of the scion tooth, and boring a hole into the fang of the lost tooth, the former may be made to take a firm hold without any attachment to the adjoining teeth; and, if due care be taken in the selection, it will make the best match, and produce the most perfect supply, that human art can bestow.

When natural teeth are not employed, the dentist has recourse to artificial teeth, commonly obtained from the tusk of the hippopotamus; though, in order to confer a greater durability, they have of late years been ingeniously formed of a composition of porcelain earth, properly modelled and burnt.

SPECIES VI.

ODONTIA INCRUSTANS.

TARTAR OF THE TEETH.

THE TEETH INCRUSTED WITH EXTRANEOUS MATTER.

The teeth are always subject to be covered over with layers of an earthy material, secreted as a constituent part of the saliva, and denominated tartar.

Simple as this substance seems to be, no very clear explanation, either of its origin or character, has hitherto been given. According to Professor Berzelius (*Animal Chymistry*, p. 62), tartar, when it first settles on the teeth, is mere hardened mucus: "but during the destruction of the mucus," says he, "we insensibly trace phosphate of lime on the enamel of the tooth, which is sometimes increased to a crust of the thickness of from a fourth to the half of a line: and in this state it contains, besides the phosphate, about a fifth part of its weight of mucus, which has been exsiccated in the earthy mass."

Tartar of the teeth, therefore, as far as it has been analyzed, consists of concrete or dried saliva, hardened by its own earthy materials. As it flows from the salivary ducts, it is always found most accumulated around those teeth which are situated nearest to their openings. In some persons the saliva is more loaded with earthy materials than in others; for, while some have very little trouble in keeping their teeth from this deposite, in others it forms so copiously, that nothing, but an unremitted attention, will preserve their teeth from being covered with it.

While this material continues soft, it has a yellowish appearance; but, as it hardens, it changes to a dark brown or a black; and often, in children, to a dark green. By degrees the teeth lose all their beauty to the eye, the gums are detached from their respective necks, are irritated and inflamed; the alveolar processes of the teeth are exposed, absorption takes place, and the teeth become loosened; while the breath is loaded with a disagreeable fetor, from the decomposition of such a mass of animal matter. In some cases the accumulation has been so enormous, as to be half an inch in thickness, both on the outside and inside of the teeth (*Berdmore*, p. 56), or to cover the whole range of teeth, and unite them into a solid heap.—(*Eustachius*, *Tract. de Dentibus*, cap. xxix. *Stoeler*, *Beobachtungen*, &c., N. 3.)

It is almost superfluous to point out the necessity of attention to prevent so foul a disfigurement. The daily use of a tooth-brush with any of the ordinary tooth-powders, will in most cases be sufficient for this purpose. The basis of these powders is of little importance, provided they contain nothing that may injure the enamel. Pulverized fish-shells, cuttle-fish-bone, boles, bark, myrrh, mastic, soot, and charcoal, may be used with equal advantage, according to the fancy; and when an odour is wished for, it may be obtained from ambergris or orris-root. It is only necessary to observe that the powder be innocent in its quality, and impalpable in its reduction.

If the tartar yield not to these means, the milder acids may be applied. I have already observed, that there are but four known acids for which the lime of the teeth has a stronger attraction than for the phosphoric, with which it is combined; and these four are, the oxalic, sulphuric, tartaric, and succinic. From these, therefore, we ought sedulously to abstain; but most of the rest may be used very harmlessly, and will often be found, by the friction of a tooth-brush, to dissolve the tartar of the teeth without making the least impression upon their substance.*

But if the deposite still bid defiance to our exertions, it must be removed by the operation of scaling; and the gums afterward be washed with some pleasant astringent lotion.

In India, the accumulation of tartar is prevented by an application named *miscee*, which produces indeed a black jet upon the teeth, but leaves the enamel untouched, while it destroys the tartar and hardens the gums. Its ingredients are not known.

SPECIES VII.
ODONTIA EXCRESCENS.
EXCRESCENT GUMS.

THE SUBSTANCE OF THE SURROUNDING GUMS EXCRESCENT.

NOT only by the concrete deposite called tartar, are the teeth occasionally incrusted and buried, but sometimes by a prurient growth of the substance of their own gums, which, from different circumstances, appears under the two following forms:

α Spongiosa. Scurvy of the gums.	Fungous, or spongy gums.
β Extuberans. Extuberant gums.	With distinct extuberances on the surface.

The gums sometimes assume a soft, fungous, or spongy appearance: and this too, as Mr. Hunter has observed (*Diseases of the Teeth*, ch. iii.), in persons who are in all other respects perfectly well: and this case, though vulgarly called a scurvy of the gums, is distinctly an idiopathic affection. It may, however, be symptomatic of dyspepsy, or some other disorder of the stomach, or some equally remote organ; or the result of a morbid state of the alveoli, or teeth themselves; and, unquestionably, it may appear as a symptom of porphyra, or real scurvy, affecting the system generally.

If the craggy stump of a tooth be the source of irritation, it will be in vain to attempt a cure till the relic of the tooth be removed: and, if the socket be in fault, it will be necessary to expose and examine it. But, in all cases in which the disease originates in the gums, and depends upon a lax state of their texture, scarification, freely and repeatedly made use of, will be the best, and, in many instances, the only remedy. It disgorges the overloaded vessels, and leads both to immediate ease and a radical cure. I have frequently found it necessary to follow up the scarification into the roof of the mouth, which often partakes of the irritation, and is puckered into wrinkles of exquisite tenderness, that cannot endure the slightest touch. After scarification, the gums and mouth should be washed with some warm and resinous tincture, as that of bark and myrrh; and be gradually accustomed to the friction of a tooth-brush,

* In recommending the use of the milder acids, the author has not duly considered their effect upon the carbonate and fluate of lime, which enter into the composition of the bone, and still more freely into that of the enamel, of the teeth. Were the teeth composed entirely of phosphate of lime, then certainly the weak acids could do no harm; but as the fact is otherwise, their use is far from being commendable. Two of the acids most frequently employed in medicine, are seriously destructive of the teeth, though not enumerated in the author's list of those which are calculated to decompose the teeth. When a tooth is steeped in diluted muriatic acid its earthy matter is dissolved, and the animal substance, with which it was united, left in a flexible state, and of the shape of the perfect tooth. What chymist is unaware that diluted nitric acid will dissolve the enamel?—ED.

and some astringent tooth-powder, in the choice of which the patient may be allowed to please his own fancy; though, perhaps, the best are those prepared from several of the more astringent funguses, and especially the *cynomorion coccineum* of Linnéus, better known by the name of *fungus Mellitensis*. And, if this plan be not sufficiently stimulant, it will be necessary to wash the mouth and gums with a very dilute solution of nitrate of silver; or to apply it, with a pencil-brush, to the gums alone in a much stronger state. Dr. Paris recommends as a dentifrice, equal parts of powdered catechu and bark, with one fourth the quantity of powdered myrrh.

The extuberant excrescence, which forms our second variety, is sometimes firm and unyielding, rising into distinct and hardened knobs, instead of assuming the appearance of soft and spongy germinations. In these cases, the general texture and consistence is that of the gums themselves: and the only radical cure consists in extirpating them with the knife, a ligature, or caustic. Even after extirpation, they are very liable to grow again, and with great obstinacy and perseverance. Mr. Hunter mentions a case, in which they were reproduced six times, as he suspected, from a cancerous disposition. They are also, in general, largely supplied with bloodvessels, which often produce a troublesome hemorrhage after the operation; [for, as Mr. Hunter observes (*Natural Hist. of the Teeth*, p. 170, 3d edit.), arteries, going to increased parts, are themselves increased, and, becoming diseased, have not the contractile power of a sound artery.

Excrescences from the gums sometimes have so cancerous an appearance, that surgeons are fearful of meddling with them. Here a remark made by Mr. Hunter, is extremely valuable to the practitioner; namely, that when the swellings arise at once from the gum, which appears to be the only diseased part, they have no malignant disposition. When, however, there is strong evidence of a tumour having originated deeply in the alveoli, the teeth, perfect as they may be in appearance, must be sacrificed, as well as the alveolar process itself. The worst diseases of the gums, as Mr. C. Bell has remarked, do not proceed from the irritation of bad teeth. We frequently see, indeed, a carious tooth attended with ulcer and gumbile, abscess of the jaw, fungous tumour of the gums, and even necrosis of the bone. We find the pain of the inflammation equal to that of tic douloureux: but the case is not to be compared, in point of danger, with the tumour, which has a deeper source, and is frequently seen growing up beneath sound teeth. The hemorrhage that follows its removal may generally be stopped with a dossil of lint, dipped in muriated tincture of iron, and pressed into the bottom of the wound.*

There cannot be a doubt, that many cases on record, which are described as malignant diseases of the gums, and as having proved fatal, by extending themselves up to the base of the brain, were, in fact, fungous diseases of the antrum.*]

* See C. Bell's Surgical Obs., vol. i., p. 413, &c., and Gibson's Institutes of Surgery, vol. ii., p. 323.

GENUS II.
PTYALISMUS.
PTYALISM.

INVOLUNTARY FLOW OF SALIVA FROM THE MOUTH.

The saliva issues from three distinct sets of glands, distributed over different parts of the mouth, as the parotid, the submaxillary, and the sublingual; [and, according to Berzelius, a quantity of it equal to 1000, consists of water 992-9; a peculiar animal matter 2-9; mucus 1-4; alkaline muriates 1-7; lactate of soda and animal matter 0-9; pure soda 0-2.—(*Med. Chir. Trans.*, vol. iii., p. 242.) What Berzelius sets down as mucus, is considered by Professor Thomson and Dr. Bostock to be albumen. This is insoluble in water, and, when incinerated, affords a large portion of phosphate of lime. The tartar of the teeth is derived from its gradual decomposition upon them. The recent investigations of Tiedemann and Gmelin, however, to which reference has been made in the physiological proem, prove saliva to be a more compound fluid than was formerly supposed; and one of their principal discoveries is, that the sulpho-cyanic acid, a most active poison, combined with potass, enters into its composition. Its solid contents are found to be, according to some chymists, 7 in 1000 parts, but, according to others, 1-25 per cent. The quantity of saliva secreted daily is considerable. Nuck and Lanzoni estimated it at a pound in twelve hours; Mr. Cruickshank at a pound in twenty-four hours; but it must vary according to circumstances. The secretion is more copious in children and old persons, than in adults; in cold, than in warm climates; in the day, than in the night. The smell or sight of any agreeable food makes the saliva flow into the mouth with surprising rapidity. The same effect results from the irritation of smoking tobacco; and from that of bitter, sour, or salt substances in the mouth. The habit of frequently ejecting spittle from the mouth renders an augmented secretion of it necessary. A person's talking much has a similar consequence; and so large is the quantity of saliva secreted during meals, that Sabatier saw a soldier, who, at these periods, used to wet several towels with what was discharged from a fistula communicating with the parotid duct.† In disease, the secretion

* For examples of the fatal ravages of some diseases of the gums, consult J. Bell's Principles of Surgery, vol. iii.; C. Bell's Quarterly Report, vol. i.; Hill, in Edinb. Med. and Surg. Journ., No. 61; and Gibson, in Philadelphia Journ., vol. ii.

† Traité d'Anat., tom. ii., p. 171. Dr. C. G. Mitscherlich, of Berlin, lately met with a similar case, in which the more solid and grateful the nature of the food was, the more copiously was the secretion of saliva carried on; but when the masseters and tongue were at rest, and no stimulus

of saliva is sometimes increased; sometimes, almost suppressed.] Its office is twofold: that of moistening the mouth in combination with a small portion of mucus secreted by the labial and buccal glands, and that of contributing to the digestion of the food in the stomach and duodenum.

Under the influence of the irritating passions, and especially of violent rage, it assumes a frothy appearance, and in many animals becomes poisonous. It is said, indeed, to become so sometimes in man himself.*

When the saliva is secreted in a healthy proportion, and the various muscles of the mouth perform their proper office, it is never discharged from the mouth, unless voluntarily; but passes readily from the fauces into the œsophagus. But it may be secreted immoderately, or the muscles of deglutition may not properly perform their functions: and, in either case, the saliva will flow from the mouth involuntarily, accompanied with a specific difference of symptoms. And hence ptyalism, as a genus, offers the two following species of disease.

1. Ptyalismus Acutus. Salivation.
2. ———— Iners. Drivelling.

SPECIES I.

PTYALISMUS ACUTUS.

SALIVATION.

INCREASED SECRETION OF SALIVA FROM AN INCREASED ACTION OF THE SALIVARY GLANDS.

An increased action of the salivary glands, productive of salivation, occurs not unfrequently as a symptom of some other disorder; and a symptom that in many cases proves highly salutary, and even critical: as in fevers of various kinds, exanthems, of which Dr. Perceval of Dublin writes me word, he has had instances in miliaria with transparent vesicles, in jaundice, and dropsy; and other examples of which are given in the author's Nosology. It often takes place also in suppressed discharges of various kinds, as those of menstruation, perspiration, and urine, and is occasionally found a useful substitute. But as in all these cases it is a mere concomitant or dependant affection, we must defer our consideration of it in these relations, till we come to the diseases themselves, of which it is a symptom or sequel.

The salivary glands are directly excited to an increased action by stimulants, or sialagogues, as they are called, of various kinds. There are numerous plants endowed with this power, which in their roots, bark, or leaves, contain a warm, acrid juice: as tobacco, mezereon, pyrethrum, or pellitory of Spain; *pimpinella saxifraga*, or smaller burnet saxifrage; imperatoria, or masterwort. Simple mechanical pressure, produced by the manducation of any hard substance, as when we eat a dry biscuit, is also a stimulant of the same kind; far less active indeed, but highly useful in its effect, as tending to resolve the substance to which the pressure is applied. Dentition is a common cause, at whatever time the teeth be produced. Even the mechanical irritation of another organ, with which the salivary glands are closely connected by continuity or sympathy, will often lead to a like effect. Mr. Powell has given an interesting instance of this in vol. ii. of the Medical Trans. of the College. A piece of wool, accustomed to be worn in the ear, had imperceptibly slid into the meatus auditorius, and for upwards of two years stimulated the organ without being suspected; during the whole of which period the patient discharged from a pint to a pint and a half of saliva daily. The ear itself at this time became painful, and was examined; the piece of wool was detected, and extracted in a very offensive state; and the salivation in a short time entirely subsided. In like manner, it is a frequent accompaniment of pregnancy; as it is occasionally of some other irritation of the stomach or intestinal canal; in which last case it frequently betrays its source by a saccharine taste. [In some cases, the cause is obscure. The editor knows a gentleman, who had several annual and tedious attacks of a very debilitating ptyalism, the reason of which was by no means apparent from any particularity in the previous state of his health, or in his regimen; and M. Ribes mentions a porter at the hospital for invalid soldiers at Paris, who was annoyed for six weeks with a salivation, that used to increase in such a degree at night, that the flow of saliva from the mouth might have been compared to a shower of very clear water.* No cause could be assigned for the complaint.]

Generally speaking, however, though not always, an increased flow of saliva from any of the above causes is of such short duration, and so easily removed when troublesome, that it is rarely the subject of medical attention; and the only varieties to which it gives rise, that are particularly worthy of notice, are the following:

α Hydrargyratus. Mercurial salivation.	Poduced by the use of mercury or its preparations.
β Sensitivus. Mouth-watering.	Produced by the sight, smell, or thought of agreeable food.
γ Mellitus. Sweet-spittle.	Accompanied with a sweet or mucilaginous taste.

was present, it ceased altogether. During meals, he found the saliva alkaline; at other periods, acid.—Ed.

* Hoffman. Diss. de Salivâ ejusque Morbis, p. 24.

* See Dict. des Sciences Méd., tom. xlix., p. 459. M. Andral could detect no morbid appearances in the salivary glands of a man, who had had a ptyalism of long duration from no evident cause.—Anat. Pathol., tom. i., p. 345. M. Rayer relates the case of a woman, aged 24, who for many years, without any obvious cause, had an attack of profuse salivation every month or six weeks. The complaint generally continued 36 or 48 hours, the quantity of fluid excreted amounting to several pints in the course of 24 hours. Opium and quinine had no effect in relieving the disorder, but it was finally cured by the subcarbonate of iron.—(Journ. de Chimie Méd., Avril, 1833.)

Quicksilver, in whatever mode introduced into the system, whether by the skin, the stomach, or the lungs, uniformly stimulates the salivary glands, and produces an increased flow of saliva: and is almost, if not altogether, the only substance we know of, which, introduced internally, universally acts in this manner. Nitric and other acids have been suspected to produce a like operation.

[The author of this work and Dr. Paris, however, both consider the opinion groundless. Yet, according to the evidence of Dr. Scott, if the nitro-muriatic acid, lotion, or bath, be employed to a certain extent, tenderness in the palate and mouth, and ptyalism, are sometimes produced; but without any offensive smell of the breath or loosening of the teeth, as from mercury. These effects were excited in himself and others, and he had seen as violent a salivation thus raised, as he had ever noticed from mercury.]—(*Med. Chir. Trans.*, vol. viii., p. 183, and *Beddoe's Contributions*, p. 430.)

Antimony has also been thought by a few practitioners to have some such influence upon the salivary glands. "Dr. James lately informed me," says Sir George Baker (*Medical Transactions of the College*, vol. i., p. 378), "that for sixteen years past his fever powder has contained no mercury; and yet, that within that space of time, he has known at least six instances of a salivation raised by his medicine. He added, that the patients who were thus salivated had neither their teeth loosened, nor their breath made offensive, as happens in a mercurial ptyalism." Fusch tells us (*Dissert. de Antochiria, Jen.*, 1681), that he has occasionally observed a like effect; as does Willich, when tartarized antimony has been employed.—(*Baldinger, N. Magazin.*, band viii., p. 252.)—[According to Dr. Paris (*Pharmacologia*, vol. i., p. 288, 6th edit.), the latter medicine in nauseating doses certainly promotes a salivation by mercury; and so does the accidental supervention of any disease of debility. The editor has seen in the King's Bench and Fleet prisons, four or five cases in which an annoying degree of salivation proceeded from the free use of the compound squill pill. A similar fact is recorded by Quarim.]—(*Animadversiones Pract.*, Viennæ, 1786.)*

From the general tendency of mercury to produce this specific effect, those who are engaged in working quicksilver mines, as those of Idria or New Spain, are almost continually in a state of salivation: and when, which is often the case, condemned as criminals to such labour for life, drag on a miserable existence, in extreme debility and emaciation, with stiff, incurvated limbs, total loss of teeth, and equal loss of appetite, till death in a few years, with a friendly stroke, puts a period to their sufferings.†

From the facility with which quicksilver evaporates, and combines, not only with other metals, but with almost all other substances, and especially with many of the elastic gases, a considerable degree of injury is often sustained by workmen in manufactories, in which quicksilver is occasionally employed, without their being for a long time aware of the cause. An instance of a similar kind occurred on board the Triumph man-of-war, which had received on board thirty tons of quicksilver, contained in leathern bags of fifty pounds each, that had been picked up on the shore at Cadiz from the wreck of two Spanish line-of-battle ships, that had been lost during a storm in March, 1810. The bags were stowed in the hold, and other low parts of the ship; but being saturated with seawater, they soon decayed and burst. The quicksilver, thus let loose, was collected as well as it could be, and committed to proper casks: but much of it escaped into the recesses of the ship; and not a little was secreted by the sailors, who amused themselves with it in various ways. The quicksilver that had escaped unnoticed sunk into the bilge-water, became partially decomposed, and ascending soon after, amidst an intolerable stench, with the vapour of the water, coated every metallic substance in the ship with a black hue; and at the same time a general affection of the mouth took place among the men and officers, to such an extent, that no less than two hundred became severely salivated, and did not recover till the ship, being carried into Gibraltar, was docked and cleaned to its lowest planks.

Mercury, however, produces different degrees of effect upon different constitutions or states of the body. In a few rare instances, it has exerted no sensible influence whatever upon the excretories of the fauces: in others, a very small quantity of almost any of its preparations has stimulated them at once to a copious discharge.

In persons of a highly nervous or irritable temperament, I have known salivation produced by a single dose of calomel; and that it is sometimes caused by dressing ulcers with red precipitate, is a fact mentioned by Hildanus, and well known to all experienced surgeons. In scorbutic, scrofulous, and other debilitated habits, very small quantities of mercury will sometimes act in the same manner; and hence a considerable degree of caution is requisite in all cases of this kind. Even the wearing of a leathern girdle, or the occasional application of white precipitate or mercurial ointment to the head to destroy vermin, has often excited salivation.

* The list of medicinal agents capable of inducing salivation might easily be increased by adding to those mentioned in the text, squills, iodine, and the oxymuriate of gold. We have seen excessive ptyalism produced also by an emetic of sulphate of zinc.—D.

† "Emaciation is the constant attendant of a mercurial course. In producing their effects, mercurial preparations, whether oxides, chlorides, cyanides, iodides, or any other, are decomposed, and the mercury, in a metallic form, is either thrown out of the body by the skin and lungs, or deposited in the glands and bones." In Hufeland's Journal it is stated, that a pelvis, infiltrated with mercury, and taken from a young woman who died of syphilis, is preserved in the Lubben Museum of Midwifery.—See Thomson's Elem. of Materia Med., t. i., p. 370—372.

When mercurial salivation is produced, it is accompanied with a high degree of irritation, not only of the mouth and fauces, but of the system generally. The common course of symptoms is as follows: the mouth feels unusually hot, and is sensible of a coppery or metallic taste; the lingual and sublingual glands swell; aphthous vesicles appear, and terminate in minute and offensive exulcerations; the tongue tumefies; the throat becomes sore; pyrexy and sleeplessness supervene, and are, indeed, often present from an early period of the disease; while in idiosyncrasies, or habits of great irritability, we frequently find the surface of the body wholly, or in particular parts, reddened with a peculiar erythematic inflammation, continuous or in patches, to which the name of hydrargyria has been given by some writers, and that of *erythema mercuriale* by others. [Gangrene and necrosis may be the consequences of immoderate mercurial salivation. Large sloughs of the parts in the mouth are very common. Cullerier has seen a partial necrosis of the lower jaw produced in this manner, and, in one young woman, a complete necrosis of the upper and lower alveolary arches.—(*Dict. des Sciences Méd.*, tom. xlix., p. 455.) The editor of this work has witnessed several melancholy examples of the same kind.]

It is difficult to determine by what means mercury produces its effect on the salivary glands. Dr. Cullen attempted one explanation of the subject; namely, that "mercury has a particular disposition to unite with ammoniacal salts, and that such salts are disposed to pass off by the salivary glands more copiously, than by any other excretion." But, as Dr. Murray has remarked, mercury has not any peculiar tendency of this kind. Indeed, if it had, no ammoniacal salts are mentioned, either by Berzelius, or by Tiedemann and Gmelin, as entering into the composition of the saliva. Dr. Cullen regards mercury as nothing more than a general irritant, operating equally upon all the sensible and moving fibres of the body, and hence powerfully operating upon all the excretories of the system, without having a special affinity to one set more than to another. "It proves often," says he, "diuretic; and I have particular proofs of its reaching and acting upon the organs of perspiration."* Another hypothesis is that of Sir Gilbert Blane,* who considers the salivary glands as one of the outlets for the rameuta of the bones, because lime is detected in the saliva, and even concretes on the teeth. Now, as mercury is known to produce an active absorption of the solids, it is ingeniously conceived, that the fact in some measure explains its effect upon the salivary glands. However, as the kidneys and other excretory glands also furnish outlets for the old particles of the body, and yet are not affected by mercury in the same degree as the salivary glands, this theory cannot be retained. The fact, however, remains the same, namely, that mercury, whether it possess a specific affinity or not for the excretories of the saliva, acts, from some cause or other, more readily and powerfully upon them than upon any other excretories whatever.

In attempting a cure of salivation from mercury, our attention is to be directed to the local state of the fauces, and the general state of the system.

If the throat be not much inflamed, acidulous gargles and acerb fruits, as the sloe, may be employed with great advantage, and should be used freely; but if there be considerable irritation, we must at first content ourselves with emollient gargles of barley-water or quince-seeds:† and in either case employ, at the same time, purgatives of Epsom or other neutral salts. When the system is much affected, sulphur and opium have been strongly recommended, and seem in many cases to have been successful. The former is trusted to, chiefly from its being well known to diminish the activity of mercury out of the body;—a doubtful reason, however, for our employing it internally.‡ The latter is certainly of considerable use in allaying the general restlessness and irritation of the system. The free exposure of the patient to a cool pure air, was found by the late Mr. John Pearson to be one of the most decided means of checking profuse salivation. The diet should be of milk. It may also be added, that perhaps there is no disease in which the Lisbon dietdrink, or compound decoction of sarsaparilla, may be used with better effect. Taken in the quantity of a quart a day, it carries off the effects of the poison, and supports the system.§

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* Mat. Med., vol. ii., p. 443. Professor A. T. Thomson entertains a similar view:—"Mercury," says he, "in whatever form it is administered, and in whatever manner it is introduced into the living body, acts as an excitant; a febrile state of the body is induced, evidenced both by the condition of the pulse, and that of the nervous system; and also by an augmented secretion and excretion of the saliva. It is this febrile excitement, overcoming or destroying the morbid action begun and maintained in the frame by the introduction of the syphilitic or venereal poison into it, which cures syphilis. The action on the salivary glands is only a symptom of this general excitement, induced by mercurials, and not in itself essential to their curative power: it may not be produced by the administration of mercurials, and yet syphilis may be cured by them. In this case the mercurials are nevertheless taken into the circulation, for they communicate a blue appearance to silver articles in the patients' pockets." Elem. of Materia Med., vol. i., p. 371.

* Trans. for the Improvement of Med. Knowledge, vol. iii., p. 112.

† As a gargle, Dr. Thomson recommends alcohol or brandy and water, or the chloro-sodaic solution of Labarraque in water, in the proportion of one part of the solution to four of water. Vol. cit. p. 375.

‡ It is remarked by Professor A. T. Thomson, that the experience of those who have had the best opportunities of judging, has not satisfied them that it possesses any efficacy in diminishing mercurial action. He adds, that if preparations of sulphur have at any time proved beneficial in checking salivation, the effect is to be referred to their acting either as sudorifics or purgatives.—Elem of Materia Med., vol. i., p. 375.

§ Dr. Falmestock states (Amer. Jour. of Med. Sciences, vol. v., p. 62), that in cases of salivation

[Some cases of inordinate salivation, recorded by Dr. Haskins, tend to prove that emetics have considerable power in relieving the disorder.*]

Like most other poisons, mercury, when properly directed, may be rendered a most valuable medicine; and is at this moment, in its multifarious forms, one of the most common, as well as one of the most efficacious, in the Materia Medica. In this place, however, we can only contemplate it as a source of disease.

A certain degree of active ptyalism is also well known to be produced by any high degree of mental or sensorial excitement; in which case, the discharge most commonly assumes a frothy appearance. This is particularly the case with violent rage, which stimulates the salivary glands almost as much as grief does the lachrymal. And as the same muscles of the mouth and throat are strongly roused in epilepsy and lyssa, we have here also a like increase of saliva, worked into the same sort of foam, and accompanied with a similar biting of the lips and gnashing of the teeth. But the most striking proof of this effect is produced by an eager longing for agreeable food of any kind, whether seen, smelt, or only thought of; and which is vulgarly denominated MOUTH-WATERING.

In man, this increase of secretion is seldom so considerable as to occasion an involuntary flow from the mouth; but, in dogs, it flows freely and continuously; for here the salivary glands are peculiarly irritable, so that the animal is almost constantly slavering; the discharge appearing to answer the purpose of insensible perspiration in other quadrupeds.

We meet also occasionally with an increased secretion of saliva from a cause less obvious, distinguished by a sweet or mawkish taste;† to which some writers have given the name of SWEET-SPITTLE.‡ It is the *dulcedo sputorum* of Professor Frank.◊ It may possibly exist, at times, as an idiopathic complaint, but is more usually connected with a morbid state of the stomach, and accompanied with a sense of nausea; the saccharine matter being formed, perhaps, by a like assimilating power as that possessed by the kidneys in diabetes. It is relieved by magnesia, and other absorbents; but is most effectually cured by an emetic, followed by warm stomachics. A lady of delicate habit, under my care, has been subject to this variety for some years. It returns irregularly, for the most part once in about a month or six weeks, and generally yields to a course of rhubarb, taken sometimes in conjunction with two or three grains of calomel. Bloch (*Bemerkungen*, p. 203) mentions a case, in which it returned at periods still more regular. This variety of ptyalism is also occasionally the result of a scorbutic diathesis, but more frequently of phthisis; and especially in the last stage, when, as Frank observes, it is often "insignis et ad nauseam usque molesta."

A ptyalism frequently occurs during dentition; and is by no means an uncommon sequel or crisis of other diseases.

In all these, as I have already hinted, it proves salutary, and terminates the disorder that excites it. Fevers afford, perhaps, the most numerous examples of this; and the following case is worth relating: A lady, aged twenty-four, of a delicate constitution, was attacked with a typhus, in the spring of 1788, which ran on for three weeks. She appeared to be in great danger; but on the twentieth day, a sudden and copious salivation took place, that unaccountably afforded her great relief. It continued for upwards of a week, the daily flow from the mouth being never less than a pint and a quarter. In the meanwhile, she increased in strength, recovered her appetite, and got well.

We have numerous instances, in which this discharge has proved equally serviceable, about the acme of smallpox;* though in one or two cases death has succeeded.† The fluid of dropsies is said to have been carried off at times by the same channel.

In the Medical Obs. and Inquiries, vol. iii., p. 241, there is a singular case of an obstinate vomiting of five months' standing, being relieved upon a return of salivation, which for this period had ceased. But perhaps one of the most extraordinary instances to be met with is related by Dr. Huxham, in the Phil. Trans., vol. xxxiii., for 1724. The patient was a man aged forty, of a spare, bilious habit, who had an attack of jaundice, followed by a paroxysm of cholic, this last being produced by drinking too freely of cider. Among other medicines was given a bolus, containing a scruple of jalap, eight grains of calomel, and a grain of opium. Copious dejections followed; and a few hours afterward the patient complained of pain and swelling in the fauces, spit up a little thick brown saliva, which was soon considerably increased in quantity, of a deep colour, resembling greenish bile, though somewhat thinner. This flux of green and bilious saliva continued for about forty hours; during which time the quantity discharged amounted to four pints. The colour

from mercury, he has used, "with uniform and unparalleled success," a gargle made from the inner bark of the root of the rhus glabrum. Professor Geddings, of Baltimore, has given the oleum terebinth with the most satisfactory results. He generally prescribes two drachms of the turpentine, mixed with eight ounces of gumarabic mucilage, to be used frequently as a gargle. He has also employed the undiluted turpentine, and with success.—(See Amer. Jour. of Med. Scien., vol. vii., p. 267.) Dr. Francis informs me that he has seen good effects resulting from pulverized charcoal, taken internally and at short intervals. In a late German periodical, Hufeland speaks highly in favour of iodine.—D.

* Philadelphia Journal, No. 2.

† Act. Nat. Cur., vol. iv., Obs. 59, 89; vol. v., Obs. 71. Degaye, Diss. de Naturâ et Usû Salivæ. Monspel. 1783.

‡ Paullini, Cent. i., Obs. 81.

◊ De Cur. Hom. Morb. Epit., tom. v., pp. 59, 85. Mannh. 8vo. 1792.

* Act. Nat. Cur., vol. vii., Obs. 109. Fich, Diss. de Salivatione spontaneâ, præcipuè Variolarum. Jen. 1713.

† Riedlin, Lin. Med., 1695, p. 384. Weber, Obs. Med. Fascic. i.

of the saliva then changed to yellow, like a solution of gamboge, with an increase rather than a diminution of the quantity. It continued of this colour for the space of forty hours more, after which it gradually became pellucid, and the salivation ceased as suddenly as it came on. During the flow of the saliva, the teeth and fauces were as green as if they had been stained with verdigris, and the teeth retained the same colour for a fortnight after the ptyalism had ceased. The patient had a few years before been suddenly attacked by a spontaneous salivation, so excessive as to endanger his life. In the present instance, therefore, it is probable, that the dose of calomel co-operated with the peculiarity of the constitution in exciting the discharge. But whatever was its cause, it proved critical, both of the jaundice and the colic; for, from the moment it took place, the pain of the bowels ceased, and the greenish colour of the skin began to subside, the urine being at the same time secreted more abundantly, and of a blackish hue.

SPECIES II.

PTYALISMUS INERS.

DRIVELLING, OR SLAVERING.

INVOLUNTARY FLOW OF SALIVA FROM A SLUGGISHNESS OF DEGLUTITION, WITHOUT INCREASED SECRETION.

THERE is a second species, which belongs to this genus, in the present system, distinguished by the name of *inert ptyalism*, and which depends upon a want of command or power over the muscles of deglutition, rather than on any increased action of the salivary excretories. In vulgar language it is denominated DRIVELLING, OR SLAVERING. It occurs under the three following modifications:

α	Infantilis.	Of infancy.
β	Senilis.	Of old age.
γ	Moriæ.	Of dotards, or idiots.

It is found, therefore, in three states of life: among infants, before the will has acquired a power over the muscles of deglutition, and is altogether distinct from the salivary flux of dentition; in advanced life, in which the will has lost its power; and in idiots, who possess the power, but seldom or never exercise it. In the first case, time is the best physician; in the two last, no physician can be of any avail.

GENUS III.

DYSPHAGIA.

DYSPHAGIA.

PAIN OR OBSTRUCTION IN SWALLOWING, WITHOUT INFLAMMATION, AND MOSTLY WITHOUT IMPEDED RESPIRATION.

IT is necessary to limit the character of this genus, as in the above definition, since inflammatory affections, in whatever part of the system they occur, constitute one natural order; and dyspnetic affections, or those essentially impeding the respiration, another order; and should, therefore, be arranged and considered in their respective associations; the former, under the diseases of the sanguineous function, and the latter, under those of the respiratory.

[Deglutition is a very complex operation, requiring the concurrence of many agents, from the mouth, where it begins, down to the cardiac orifice of the stomach, where it terminates. It may be divided into three stages: in the first, the food passes from the mouth to the pharynx; in the second, it passes the opening of the glottis, and the nasal apertures in the fauces, and is carried into the œsophagus; in the third, it passes through this tube, and enters the stomach. When a portion of food has been sufficiently chewed, it is placed by the actions of mastication upon the dorsum of the tongue. Mastication is then suspended, and the tongue applied to the roof of the mouth in succession, from its point to its base. The alimentary bolus is thus pressed towards the pharynx, and soon meets with the velum palati, which is raised up by it into the horizontal position, and made a continuation of the palate. As the tongue continues to press the food, it would push it towards the nasal openings in the fauces, if it were not for the tension of the velum palati, produced by the circumflex muscles and the constriction of the pillars. With the exception of the motions of the velum, these actions in the first stage of deglutition are slow, voluntary, few, and successive. In the second stage, the actions are simultaneous, multiplied, involuntary, and rapid; the food is conveyed by them only from the middle to the bottom of the pharynx; but quickness is essential, in order that the aliment may not insinuate itself into the glottis, impede respiration, or glide into the nasal openings in the fauces, or the apertures of the Eustachian tubes. The aliment no sooner touches the pharynx, than it is embraced by this part and the velum palati. At the same instant, the base of the tongue, the os hyoides, and the larynx, are raised and carried forward to meet the morsel of food, and transmit it rapidly over the glottis, which is now shut, and also covered by the descent of the epiglottis. By the continued pressure of the pharynx and velum palati, the food is next pushed into the œsophagus, the larynx descends, the epiglottis rises, and the glottis itself is opened again for respiration. In the third stage of deglutition, the arrival of the food in the upper part of the œsophagus causes the superior circular fibres of this canal to contract, and propel the aliment towards the stomach. The subsequent fibres, now distended, contract in their turn; and the same changes are continued in succession, until the food gets into the stomach. The experiments of Magendie convince him, that the aliment passes very slowly down the œsophagus, and, when its ready entrance into the stomach is prevented, it will sometimes rise and descend again several times before it is ejected.* From the preceding account it

* See Magendie's Physiology, by Milligan, 2d edit., p. 238.

must be manifest, that many different causes may be concerned in bringing on a difficulty of swallowing; and that dysphagia, strictly speaking, is not a disease itself, but only one of the most dangerous effects of the diseases to which the organs of deglutition, or other parts in the neighbourhood of them, are subject. The history of every form of dysphagia would make therefore a very long detail, comprising an account of most of the diseases of the mouth, throat, nasal cavities, pharynx, larynx,* and œsophagus, as well as of various accidental injuries of parts about the throat, and of many sorts of tumours within or near the mouth, the pharynx, or œsophagus.† In the present part of this work, the author enters into the consideration of the six following species :—]

1. Dysphagia Constricta. Constrictive Dysphagia.
2. ——— Atonica. Atonic Dysphagia.
3. ——— Globosa. Spasmodic dysphagia, or Nervous Quinsy.
4. ——— Uvulosa. Uvular Dysphagia.
5. ——— Linguosa. Lingual Dysphagia.
6. ——— Pharyngea. Pharyngeal Dysphagia.

[The several cases of dysphagia arising from a diminution of the capacity of the œsophagus by disease of its texture, or from its being occupied or compressed by tumours of different sorts, are at first so similar in their symptoms and progress, that a successful discrimination of them is not always easy. In all of them, one of the earliest symptoms is a difficulty of swallowing solids, followed, after a time, by that of swallowing fluids. This inconvenience makes more or less rapid advance, and if not relieved by medical treatment (which is too often impracticable), terminates in a fatal interruption of the function of deglutition. With the exception of spasmodic dysphagia, and cases of mechanical injuries of the jaw and parts about the mouth and throat, almost all the species of dysphagia come on very gradually, and with so little annoyance that at first they are apt to be disregarded, more especially as the health is generally good, and the inconvenience in swallowing sometimes abates for a time, or even quite ceases. Nor in general can any defect be seen or felt in the mouth or pharynx; the food passes the isthmus of the fauces very well, and proceeds duly towards the stomach; but it soon rises into the mouth again, with a large quantity of saliva, unaccompanied by any effort of the stomach, diaphragm, and abdominal muscles. The patient again tries to swallow, and, perhaps, after repeated attempts, succeeds in getting the food into the stomach, in small quantities at a time. Thus the disease is allowed to go on unresisted for a long period. The kind of rumination resulting from the inverted peristaltic action of the œsophagus, differs from common vomiting, inasmuch as the food is ejected without anxiety, indisposition, or cold sweats. Notwithstanding the difficulty of swallowing, the appetite often continues good, almost until the very approach of death.]

SPECIES I.
DYSPHAGIA CONSTRICTA.
CONSTRICTIVE DYSPHAGIA.

DIFFICULTY OF SWALLOWING, FROM A PERMANENT CONTRACTION OF THE ŒSOPHAGUS.

Sometimes the diameter of the canal is diminished in particular parts by a thickening of the mucous membrane, fleshy excrescences, or fungous,* or scirrhous tumours. The same

* Dr. Abercrombie has seen several cases of disease of the larynx in which the dysphagia was the prominent symptom, so as to lead to the supposition of disease of the œsophagus. In one instance the epiglottis was thickened and much elongated; the patient had no constant difficulty of swallowing, but was liable to sudden attacks of it during his meals, which threatened instant suffocation. In another case, the dysphagia was permanent, and combined with a hoarse, husky cough, and slight dyspnœa. The whole body of the larynx was very much enlarged and thickened; and some ulceration existed in it internally towards the œsophagus. In both cases the œsophagus was entirely healthy.—See Abercrombie's Pathol. and Pract. Researches on Diseases of the Stomach, &c., p. 97, ed. 2.

† Instances are recorded by Valsalva and others of dysphagia from dislocation of the os hyoides. In the *Journ. des Progrès*, &c., t. xiv., p. 250, a case of this kind is related, which was cured by reduction. Dr. Abercrombie gives the following particulars of another example: "An eminent medical man, now deceased, was liable to this accident, and I have seen him seized with it in an instant, while engaged in conversation. It produced slight difficulty of articulation, and total inability to swallow. He easily relieved himself by a particular movement of the parts with his hand, which had become familiar to him from the frequent occurrence of the accident."—(Pathological and Practical Researches on Diseases of the Stomach, Intestinal Canal, &c., p. 102, ed. 2. 1830.) See another case in Med. Gazette, vol. iv., originally reported by Dr. Mugna in the *Annali Universali*. Sir Charles Bell had a preparation, exhibiting a projection of one of the horns of the os hyoides into the pharynx in consequence of ulceration.—(Surgical Obs., p. 60.) Bleuland gives the particulars of a dysphagia produced by the pressure of an exostosis of the vertebræ upon the œsophagus. Sir Astley Cooper reports an example, in which the same consequence arose from a dislocation of the sternal end of the clavicle backward. Aneurism of the aorta frequently causes dysphagia, which may exist long before the original disease is suspected. Dr. Abercrombie refers to a case in which a probang was passed, under the idea of stricture of the œsophagus; it occasioned rupture of the aneurism, and almost immediate death.—(Op. cit., p. 100.) Among numerous other circumstances which may occasion dysphagia by pressure on the œsophagus, I may mention enlargement of the thyroid gland, bronchial glands, or glands in the posterior mediastinum; great distention of the pericardium.—(Bleuland de sana et morbosa Œsophagi Structura.) I dismiss from present consideration dysphagia from congenital malformations and imperfections of the pharynx, œsophagus, palate, &c. Sir Astley Cooper reports the case of an infant which, though born without an œsophagus, lived eight days.—Ed.

* In Dr. Armstrong's Morbid Anatomy of the

effect may proceed from tumours formed between the coats of the œsophagus.—(*C. Bell's Surg. Obs.*, p. 60.) Sometimes a scirrhous thickening of its coats, or of the cellular membrane connecting them,* extends through its entire length; and sometimes it becomes contracted by the conversion of a portion of it into cartilage or bone. Besides these cases, there are other casual and symptomatic obstructions, which do not fall under our present survey, produced by hysteria and other spasmodic affections; enthesis, or the lodgment of foreign bodies in the canal; or external tumours, as in bronchocele, abscesses,† or aneurism of the aorta, pressing against its sides.

[The œsophagus is much less frequently the seat of disease than the mouth and the pharynx, and especially than the stomach and other parts of the digestive tube, below the diaphragm.—(*Andral, Anat. Pathol.*, t. ii., p. 244.) Its lining, like all other mucous membranes, is liable to be thickened by inflammation; the diameter of the passage is thereby lessened; the muscular fibres cannot act upon it with their usual power; and the conveyance of the food into the stomach is more or less obstructed. True strictures of the œsophagus, like those of the urethra, generally occupy but a small extent of the canal, and are for a long time attended with very little thickening of the adjacent parts. The derangement is in the inner membrane of the tube; there is no apparent disease of the tunica vaginalis gulæ; nor any degree of thickening of the glandular structure.—(*C. Bell, Surgical Obs.*, p. 80.) Strictures may occur in any portion of the tube; but their most frequent situation is immediately behind the cricoid cartilage at the termination of the pharynx. Sometimes the pharynx and beginning of the œsophagus are studded with scirrhous tumours of great firmness and whiteness, nearly closing the latter canal; while a general disposition to disease of its membrane is denoted by tumours of a similar nature lower down the passage. At the same time, the membrane, reflected over the glottis into the trachea, may be thickened, and even swellings of the above description present themselves within the latter organ. Another form of scirrhus of the œsophagus is very analogous to the disease called the scirrho-contracted rectum; it involves all the coats of the tube, and though it may affect the greater part of the passage, it generally commences either in the upper portion of it behind the cricoid cartilage, or far down near the cardia, where the structure is very glandular.—(*Monro's Morbid Anat. of the Gullet*, &c., p. 325.) Scirrhus changes the texture of the œsophagus sometimes into a hard, uniformly fleshy substance, and sometimes into a substance of a gristly nature, or intersected by membranes.—(*Baillie's Works, by Wardrop*, vol. ii., p. 93.) Under such circumstances, the canal is always rendered narrower, and often nearly closed. The disease is also frequently complicated with ulceration, which is mostly seen either above or below the most constricted point, not exactly in it. A fact meriting attention is, that obstructions situated high up in the œsophagus, frequently give rise to ulceration of the lower part of it, near the stomach, just as strictures in the urethra often produce ulceration of that canal towards the bladder. In the œsophagus, this kind of ulceration is most liable to occur when the obstruction has existed a long time; and the frequent retching is conjectured to be the occasion of it. Though ulceration does not generally attack the most constricted portion of the tube, it does so in particular examples, just as it does in the urethra, and this in such a manner that the obstruction is more or less removed. Relief only follows this event, however, in cases of common stricture of the mucous membrane; for when the disease is of a scirrhous nature, ulceration always proves an aggravation of the complaint, instead of a possible means of relief. Indeed, when the œsophagus has been rendered even more capacious than natural by the effects of scirrhous ulceration, the continuity of the muscular action, by which the food is transmitted to the stomach, is interrupted, and a disease, very different from stricture, resembles it in its most essential circumstance, the incapacity of swallowing.* By ulceration of the œsophagus, preternatural communications may be formed between that

Stomach, &c. (Plate 8), may be seen a representation of a stricture occasioned by the cardia being surrounded by a tumour, that had the character of fungus hæmatodes, or, as he terms it, fungus encephaloides. The same author had seen another similar case; and both proved fatal before any degree of softening took place in the morbid substance. No similar formations were found in other parts.—EDITOR.

* See Armstrong's Morbid Anat., fasciculus 2; pl. 7, fig. 2.

† Mr. Carmichael has recorded two fatal examples of dysphagia, from abscess between the œsophagus and cervical vertebræ, where, from the situation and circumstances of the disease, as found on dissection, he conceives that the patients' lives might have been saved, had the collection of matter been discharged with a curved trocar.—See Trans. of Association of Physicians of Ireland, vol. iii., p. 170, &c. "A remarkable case occurred to Mr. George Bell, in which the dysphagia had existed so long that it was considered as an example of stricture of the œsophagus, and a probang was introduced. When this reached the part, which was very low down, it ruptured the abscess, and an immense discharge of matter took place, with immediate and permanent relief."—(Abercrombie's Pathol. and Pract. Researches on the Stomach, &c., p. 99.) The same author quotes from Bleuland a case of fatal dysphagia from abscess between the vertebræ and upper part of the œsophagus. Collections of matter in the lungs may also press upon this tube, and ultimately form a communication with it; examples of which are referred to in Dr. Abercrombie's work, on the authority of Bleuland and Künze (De Dysphagia).—EDITOR.

* Sir C. Bell, in Surg. Obs., p. 62. According to Dr. Armstrong, when a softening of the scirrhous matter takes place, the muscular coat may suffer in the destructive process, and be attenuated.—(Morbid Anat., &c., p. 54.) He adds, that, in general, it seems thickened, owing to the cellular texture connecting its fibres being in this state.

tube and the trachea,* lungs,† or aorta. The latter state may also be the result of disease first commencing in the great arterial trunk itself.—(*Meckel's Anat.*, vol. iii., p. 254.) Here also the remarkable case of Admiral Wassenaer deserves to be mentioned, who, according to Boërhaave, died suddenly in the act of attempting to vomit soon after dinner, and whose œsophagus was found to have given way in the seat of an ulcer, so that all the food and drink taken at dinner had become effused in the cavity of the chest. A similar case, in which the œsophagus was perforated near the cardia, and the contents of the stomach, together with a lumbricus worm four inches in length, were effused in the chest, is recorded in a modern work.‡

Dr. Baillie once met with a very unusual stricture in the œsophagus, arising from the puckered state of the mucous membrane, which, as well as the muscular fibres, was quite free from all morbid alteration.

When the diameter of the lower portion of the œsophagus is much diminished, the food often accumulates above the most contracted portion of the passage, which becomes dilated above the obstruction, and is sometimes converted into a kind of pouch, nearly as capacious as the stomach itself. Cases of this description are recorded by Blasius, Haller, and Mayo. In most examples, the dilatation is a general one, comprising the whole circumference of the tube. The formation of a true sac, however, some particular point is more ra[re]. In Dr. W. Hunter's museum may be seen a pouch of this kind, formed at the lower end of the pharynx, and extending down behind the œsophagus. Its origin was ascribed to a cherry-stone, which remained three days in the lower part of the pharynx, where it made a depression, in which the victuals afterward lodged. In about five years the pouch was large enough to hold several ounces of fluid. Its situation and size, particularly when distended with food, occasioned extreme difficulty of swallowing, by which the patient was ultimately destroyed. An example of a pouch at the lower and back part of the pharynx, and extending between the spine and œsophagus, so as to cause great difficulty of swallowing, is recorded by Sir C. Bell. —(*Surg. Obs.*, p. 64.) After death the bag was not found to be covered by muscular fibres, as in Mr. Ludlow's case, but consisted of a protrusion of the inner coat between the strong muscular fibres of the pharynx. The patient used to suffer as much from flatulence as from dysphagia, and in consequence of the entrance of bougies into the opening of the sac, it was difficult to pass them. Pouches of this description are sometimes the result of abscesses, which burst into the pharynx. An instance in which there were two large sacs reaching from the pharynx along the sides of the œsophagus and trachea, and betwixt the former and the vertebræ of the neck, was seen by Sir C. Bell. The mechanical operation of these pouches, and their valvular communications with the pharynx, by which the food that insinuated itself into them was confined there, occasioned the patient's death from irritation and inanition.*

Cases of dysphagia attended with the formation of the above kind of sacs, have been pronounced inevitably mortal.—(*Jourdan, in Dict. des Sciences Méd.*, tom. x., p. 439.) This melancholy prognosis, it is to be presumed, would be fully warranted where the sac was the consequence of a scirrhous disease of the œsophagus; yet if Dr. Odier has taken a correct view of a case that occurred at Geneva, an example, in which the œsophagus was in a scirrhous state, and there was a large prominent pouch on each side of the neck, yielded to medical treatment.] The food which the patient, a young nobleman, took, commonly remained in these sacs an hour or two, and was then thrown up. Hemlock pills were prescribed, and a bandage applied to the protuberance. As soon as the pills were rejected, which, like the food, they were sure to be in an hour or two, their place was supplied by others, so as to let the hemlock constantly act on the seat of the disease. The st[omach] soon experienced relief, and was grad[ually] patien[t]; the pouches disappeared; the ali[ment] ually cure[d] ded into the stomach; and the ments descen[ded] ed its former calibre.—(*Edin.* œsophagus recove[red] ., p. 193.)

Med. Convers., vol. i[i.] nic thickening of the

[In stricture from ch[ronic] nt feels, instead of mucous membrane, the patie[nt] or tightness, actual pain, a sort of pressu[re] al canal, or either in the course of the intest[ines] the exact about the shoulders. He points out uction part of the œsophagus in which the obst[ruction] the is situated; and the lower this point is,

* Van Doeveren, Obs. Anat. Pathol. Ludg., 1789, obs. 2; and Monro's Morbid Anatomy of the Human Gullet, p. 325, pl. ix.

† Bleuland, de Difficili Aliment. Depulsione, obs. 1, p. 48, fig. 112.

‡ Revue Méd., Février, 1823. Some cases of softening and attenuation of the parietes of the œsophagus, followed by its rupture, are quoted by Andral.—See Anat. Pathol., t. ii., p. 246. In every instance of this kind hitherto reported, the tube gave way in the thoracic portion of the œsophagus near the cardia. The change is analogous to what has been considered by Hunter as the digestion of parts of the stomach by the gastric juice after death, and, indeed, it may depend upon the action of the same fluid, under particular circumstances.—ED.

* Surg. Obs., p. 71. With the assistance of Mr. Broxholm, of Sunbury, the editor removed from the late Mr. Champion of Halliford, a tumour that was situated just below the occiput. Its consistence was that of cartilage, and its size that of a large orange. It had been growing many years. The reason which induced the patient at length to submit to an operation, was, a serious difficulty of deglutition, which he supposed might depend upon the irritation of the tumour. After the removal of the swelling, the wound healed up very well, but no amendment took place in the power of swallowing, and the patient, who could hardly take any nourishment for two or three weeks, died in a very emaciated state, about two months after the removal of the tumour. On dissection, a thickening of the parietes of the œsophagus was detected, attended with a very close stricture, and a pouch above it, containing some orange pips.

greater reason has the practitioner to suspect a thickened state of the coats of the canal. The unpleasant sensations sometimes extend to the cardiac orifice of the stomach; but they are only felt when the patient makes attempts to swallow. In the early stage, the food does not return into the mouth till long after a meal, sometimes not till four or five hours afterward. As the disease makes progress, however, the return is quicker, and the quantity of aliment brought up again larger. Lastly, when the case approaches its fatal termination, the food is often rejected almost as soon as the effort is made to swallow it.

Dysphagia arising from scirrhus of the œsophagus, is attended with symptoms very similar to those of stricture. Pain, and inability to swallow solids, are the early symptoms. After a time the passage of fluids is arrested; they remain for a short time in the canal, and, distending it, create a sense of suffocation. At length, they are partly rejected by an inverted action of the œsophagus through the nose and mouth, and the rest passes down with a gurgling noise.—(*Monro's Morb. Anat. of the Gullet*, &c., p. 326.) By careful and experienced observers, however, some circumstances have been noticed by which a scirrhus of the œsophagus is more particularly characterized. The patient is conscious of a dull pain and oppressive tightness, not only when he attempts to swallow, but at other times; and, if credit can be given to Wichmann, who first made this remark, the disagreeable sensation and the difficulty of swallowing cease in a great measure when the patient lies down upon his back. In addition to these particulars, Richerand's observation merits attention, namely, that a bougie is generally more easy of introduction, than in cases of stricture. The disease is reported to be sometimes met with in very young subjects as well as others, Percival having observed it in a child only thirteen years of age, and Wichmann in three children under eight. A question, however, here presents itself, namely, whether these were examples of true scirrhous disease of the œsophagus, or only scrofulous swellings of the lymphatic glands, which are well known to be particularly common in young subjects!]

Where osthexia, or an ossific diathesis, is present, the stricture sometimes assumes a bony hardness; and Metzger (*Advers. Med.*, vol. i., p. 175) gives a pitiable case of this kind, in which the passage was so narrow, that the unhappy patient perished altogether of hunger! At times, indeed, the œsophagus has become entirely imperforate, either from the increasing contraction, or from the enlargement of internal or surrounding tubercles: of the former, Rhodius relates a singular case.—(Cent. ii. Obs. 46.) Examples of the latter have occasionally followed smallpox,* or strumous indurations.†

In a few instances, half the length of the œsophagus has been completely gorged by a single fleshy or glandiform excrescence. One patient thus afflicted died of marasmus in the seventh month from the commencement of the disease, and in the prime of his life. The tumour reached from the middle of the canal to the cardia, and so thoroughly blocked it up that a probe was with difficulty passed into the stomach on examining the part after death.—(*Edinb. Med. Essays*, vol. ii., art. xxiv.) An analogous case is recorded by Sir C. Bell.—(*Surgical Obs.*, p. 79.)

Of stricture of the œsophagus, it is often difficult to trace the remote causes. A neglected catarrh; common sore throat; smallpox; syphilis; a highly nervous or spasmodic diathesis; the smoke of tobacco; the use of the *datura stramonium* (*Eph. Nat. Cur.*, Dec. iii., Ann. i., obs. 79; and Ann. ii., obs. 68); the abuse of mercurial preparations; drinking too largely of coffee, or any other fluid immoderately hot or cold; and an inflammation of the pharynx and œsophagus produced by swallowing soap-lees,* or other injuries, are various remote causes mentioned by writers. A temporary contraction of the œsophagus is said to have also been produced by worms in the stomach and intestines; and in one or two instances, apparently, by worms lodged in the hepatic and common duct.—(*Eschenbach, Vermischter Bemerkungen*, i.) [With respect to some glandular swellings and tubercles, by which the œsophagus becomes obstructed, there can be no doubt that they depend upon scrofula.† Of the causes of scirrhus of the pharynx and œsophagus, nothing certain is known. Under the head of *dysphagia constricta*, the learned author of this work has included many diseases of very different characters, as common stricture, from a thickening of the mucous membrane of the œsophagus; scirrhous and various sarcomatous indurations and thickenings of the parietes of the canal; and obstruction of it by glandular swellings and other tumours, either situated between its coats or growing from them.

No medicine has the power to remove a permanent stricture of the œsophagus arising from a thickened and contracted state of the mucous membrane. This is a very different case from spasmodic constriction of the canal, where no organic disease prevails, and the power of antispasmodic medicines, emetics, cold drinks, cold lotions, blisters, and alteratives, is considerable.

* Act. Hafn., vol. i., obs. 109. Eph. Nat. Cur., Dec. ii., Ann. ix., obs. 45.

† Manchart, Diss. de Struma Œsophagi, hujusque Coalitu, &c. Tubing., 1742.

* Sir C. Bell, in Surgical Obs., p. 83; Dr. Cumin, in Edin. Med. Chir. Trans., vol. iii., part ii.; and a case under Dr. Renton, as quoted in Abercrombie's Pathol. and Pract. Researches on Diseases of the Stomach, &c., 2d ed., p. 98.

† This is generally the case, but tubercles may obstruct the œsophagus in persons free from any suspicion of scrofulous taint. Preternatural irritability of the stomach may be the sequel of gastric irritation, as in yellow fever or in stricture of the pylorus, and the long continuance of either of these states may lead to disease of the œsophagus, and to the formation of tubercles. A case of this kind, occurring in the practice of Prof. Francis, is mentioned in the Trans. of the New York Lit. and Phil. Society, vol. i., p. 506.—D.

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In the instance of permanent stricture, the proper course is the use of the bougie; and where the attempt to dilate the part brings on violent spasm and great disturbance of the constitution, even caustic bougies may be tried, as recommended by Sir Everard Home. In general, however, the common bougie should be preferred, and the armed one employed only in formidable and unyielding cases. In proportion as the stricture gives way, the size of the bougie must be increased. If an example were to present itself, in which the dysphagia was known to depend upon the connexion of one or more preternatural pouches with the pharynx or œsophagus, combined or not with a stricture or other disease of the passage, the means from which the greatest relief might be expected would be, I think, the introduction of an elastic gum tube, by which the food might be prevented from distending the pouch, and the stricture at the same time dilated. Whether also the obliteration of the pouch might be safely attempted by throwing an astringent injection into it, as suggested by Sir C. Bell (*Surgical Obs.*, p. 69), future experience must determine. Elastic gum catheters are of important use in diseases of the œsophagus, not only as a means of effecting the dilatation of strictures, but as a contrivance for feeding the patient, without any action or disturbance of the diseased part itself. A proof of the accuracy of these remarks will be found in the particulars of Dr. Cumin's interesting case already referred to.

In the early stage of a scirrhous or sarcomatous obstruction of the œsophagus, leeches, blisters, or issues on the throat, may be tried, together with an emetic, a course of the compound calomel pill, and occasional aperient medicines. The issues on the sides of the throat, and the use of bougies, Sir C. Bell assures us, will effect a cure when there is a mere thickening from common inflammation or scrofulous action. Were a case of this description to present itself to the editor, he would be disposed to give the internal and external use of iodine a fair trial. Except in the above examples, however, little benefit can be expected from this or any other plan. In these cases, as well as in those of common stricture, the patient should generally be fed by means of an elastic gum tube, passed from the nostril down the œsophagus.] In an early period of the disease, some benefit has been derived from hemlock and ammoniated copper. And sometimes mercury carried to the point of salivation,* has been found serviceable. Dr. Munkley relates one case of great severity, and even of some years' standing, in which mercury carried to the effect of ptyalism, was perfectly successful.

A stomach syringe, for diluting and washing away various poisons introduced into the stomach, whether by design or accident, was [first suggested by Renault in his work on poisons. Dr. Monro afterward gave drawings of instruments for the removal of laudanum from the stomach.—(*Thesis de Dysphagia*, Edin. 1797.) However, until Dr. Physic (*Eclec. Repert.*, vol. iii., p. 111; also *Gibson's Surgery*, vol. ii., p. 362) proved the utility of the stomach-pump in the case of a child poisoned with laudanum, the invention gained little attention. As now perfected by Mr. Read and others,] it appears to be admirably adapted to the joint object of enlarging the diameter of the œsophagus by a gradual pressure, and of conveying any quantity of liquid food that may be desirable. The instrument, as brought into notice by Mr. Jukes, consists of an elastic gum tube, a quarter of an inch in diameter, and two feet and a half in length, terminating in the lower extremity, or that introduced into the stomach, in a minute globe of ivory with various perforations, which for the present purpose must be omitted, and fitted at the upper end, either by a screw or a plug, to an elastic bottle of sufficient size to contain at least a quart of liquid, with a stopcock fitted to it, as in the hydrocele bottle. Instead of the bottle, a pewter syringe may be adapted, of equal capacity, and used in the same manner.

The bottle or syringe being filled with warm water, and fitted to the tube already introduced into the stomach by the mouth or a nostril, on turning the stopcock the water or other liquid may easily be forced into the stomach, and withdrawn by a reverse action: and hence laudanum, or any other poison capable of dilution, may be pumped up in a diluted state till the stomach is entirely unloaded; and liquid food may be introduced to any extent, at option. Mr. Jukes has tried the instrument on himself, as well as on various patients, with complete success, in one or two cases after ten drachms of laudanum had been swallowed for the purpose.—(*Lond. Med. and Phys. Journ.*, No. 48, p. 334.)

* Rush, Inquiries and Observations. Brisbane, Select Cases. Dobson, Med. Obs. and Inq., vi.

SPECIES II.
DYSPHAGIA ATONICA.
ATONIC DYSPHAGIA.

DIFFICULTY OF SWALLOWING FROM DEBILITY OF THE MUSCLES OF DEGLUTITION.

The external tunic of the œsophagus is muscular, and the muscular fibres are both transverse and longitudinal. The propulsion of the food from the fauces into the stomach, commences in the action of the circular fibres of the pharynx, which contract in succession, and in a downward direction; and as this direction is continued to the muscular fibres of the œsophagus, the swallowed morsel is carried forward into the stomach by a progressive or peristaltic action.

Now, in all cases of debility in the muscles of deglutition, the contractile action of their fibres, and consequently their propulsive power, is lost or enfeebled, and a difficulty of swallowing must be the necessary consequence. [Persons of advanced years are most subject to dysphagia from paralysis of the œsophagus; though the disease sometimes occurs in the middle period of life, and even in youth. Thus, Dr. Monro (*Morbid Anat. of the Human Gullet*, &c., p.

231, 232), records one instance of it, brought on in a country lad, nineteen years of age, by a previous febrile attack; and another case where it came on suddenly in a soldier, aged thirty-two, whose mouth was also drawn a little to the left side, indicating the connexion of the complaint with apoplexy. In atonic or paralytic dysphagia, patients generally swallow solids more easily than fluids, the conveyance of which into the stomach requires a greater effort and a more complete agreement among all the organs concerned. A probang may readily be introduced down the passage, without producing any aggravation of the complaint, as it does in cases of spasm. The patient cannot fix upon any particular point as the situation of obstruction, and he is not sensible of any pain, tightness, or feeling of weight, except at the periods of making an attempt at deglutition. When the paralysis is complete nothing can be swallowed, and it is indispensable to feed the patient by means of a tube. When liquids pass down a certain way, and are then forced up, the paralysis probably occupies only a part of the œsophagus. Atonic or paralytic dysphagia may be the effect of apoplexy and other diseases, or injury of the brain; also of fevers; of exposure to cold and damp; and of disorder of the digestive organs. It is a symptom of the last stages of fever, and phthisis pulmonalis. In such cases a small quantity of any fluid frequently cannot be swallowed, because it does not give a sufficient stimulus; but deglutition will be executed if a large spoonful be given.—(*Monro, op. cit.*, p. 234.) The treatment of atonic dysphagia must vary according to the nature of the cause. When the disease is the consequence of apoplexy, the means best calculated to lessen the difficulty of swallowing, are the same as those required for the relief of the original complaint. When the dysphagia has been associated with pain at the pit of the stomach, difficulty of breathing, palpitation, and flatulence, a cure has been accomplished by cordial volatile medicines, blisters, issues, and five grains of the pill myrrhæ comp., given every night at bedtime.—(*Monro's Morbid Anat.*, &c., p. 231.)

In many cases, repeated blisters to the throat and chest, which stimulate from without, and tonic and astringent gargles, as of alum, catechu, rhatany, port-wine, and decoction of cinchona, which stimulate from within, will afford relief. Stimulating sialagogues may also be employed with advantage.

A draught of cold water drunk frequently during the daytime, and especially at night and morning, has also, as a tonic, been frequently useful. And if the habit be relaxed or irritable, the same tonic plan should be rendered general as well as local; and be especially combined with exercise, sea-air, sea-bathing, [electricity, galvanism, and the use of spirituous fomentations, as strong camphorated liniments, to the throat and neck. When no organic disease of the brain or spinal marrow is present, electricity is deemed one of the best remedies: several examples of its efficacy are given by Dr. Monro, and in one interesting case, the patient could only swallow when seated on the electrical stool. In some cases recorded by Tode and Wichmann, a cure was effected by the free exhibition of quassia.]—(*Dict. des Sciences Med.*, tom. x., p. 444.) Hard study must be relinquished, and, if possible, anxiety of mind

SPECIES III.
DYSPHAGIA GLOBOSA.
NERVOUS QUINSY.

DIFFICULTY OF SWALLOWING FROM WIND IN THE STOMACH, SPASMODICALLY COMPRESSED INTO THE FEELING OF A BALL ASCENDING INTO THE ŒSOPHAGUS, AND PRODUCING A SENSE OF STRANGULATION.

FROM this feeling of a hard ball in the throat, the species is in the present system distinguished by the specific name of *globosa*. It is peculiarly common to persons of a nervous or spasmodic temperament: and is hence called by Dr. Darwin and many other writers, *globus hystericus*, and by Dr. Heberden, *nervous quinsy*.

Most frequently it occurs as a mere symptom of the hysteric or hypochondriacal affection; and on this account is regarded as such alone by many nosologists. It is, however, often to be traced in sudden gusts of passion, as fear, grief, and anger, especially in young subjects, whose passions have never been disciplined; and at times exhibits so much violence as to threaten suffocation. In nervous habits, I have frequently met with it as a pure idiopathic affection; and, in a few instances, in persons who are not thus constitutionally predisposed to it.

Two clergymen of this metropolis, who bear an equally high character for pulpit eloquence, and have a very sufficient self-possession, have been occasionally under my care for some years, in consequence of this complaint. One of them has most commonly been attacked during dinner; the regular action of the muscles, in swallowing, being converted, from debility of the organ, into the irregular action of spasm. The other received the first paroxysm while reading the service in his own parish-church, and was incapable of proceeding with it. In this case, the regular action of the muscles of the glottis, in speaking, excited irregular action in those of the œsophagus, from contiguous sympathy. And the effect was so considerable, that, when the clergyman came to the same passage of the liturgy on the ensuing Sunday, he was obliged to stop again, for he found he could not get through it. But he preached with as much fluency as ever; and this, too, with nothing more than a syllabus of his discourse before him. It was many weeks before he could summon courage to make another attempt in the desk; and his first effort was even then made in another church, and before another congregation. In this he was fortunate enough to succeed; and he has now entirely overcome the morbid habit.

In both these cases, I have found the most effectual remedy at the moment to be a tumbler of cold water swallowed gradually, and the application of a handkerchief, dipped in cold

water, to the throat. The spasm thus counteracted soon ceases; and, in the cases before us, has returned not only less frequently, but with far less violence. Yet during the intervals, general tonics, a light diet at regular hours, and as much as possible horse exercise, have been had recourse to, and contributed their respective services.

The usual antispasmodics, ammonia, ether, camphire, assafœtida, and even laudanum, had formerly been tried, but, I was told, with little success.

When ether is had recourse to, whether in this or any other affection, the best means of dissolving it is a preparation little known in our own country, but which is introduced into the French Pharmacopœia under the name of Oleum de vitellis ovi, obtained by evaporating the mixed yolks of eggs to about half; the oil is produced from this by pressure, but it must be afterward filtered through paper to become refined.

SPECIES IV.
DYSPHAGIA UVULOSA.
UVULAR DYSPHAGIA.

SWALLOWING OBSTRUCTED, OR TROUBLESOME, FROM RELAXATION AND ENLARGEMENT, OR FROM DESTITUTION, OF THE UVULA.

The uvula is sometimes enlarged from inflammation; but, in such case, the disease, for reasons already stated, belongs to another class. In the inflammatory state, the uvula is hot, acutely painful, of a red or livid colour, and deviates, as it enlarges, from its proper form. In the species before us, its natural form and colour are scarcely interfered with, excepting that, as it grows larger and longer, it also grows paler. It is soft, relaxed, and œdematous.* [The affection is a chronic elongation and thickening of the part; an occasional consequence of syphilis, protracted fevers, and the use of mercury. It also sometimes proceeds, in professional singers, from immoderate exertion of the vocal organs. The patient has a sensation, as if the throat were blocked up by some largish body; the annoyance is considerable; and he is compelled to be continually coughing and swallowing his spittle. Some cases depend upon relaxation of the azygos, or levator muscle of the uvula.]

The complaint, therefore, in this variety, requires to be treated with spirituous and astringent stimulants. Gargles of alum, Cayenne pepper, or port-wine, are the local applications commonly used, and they should be combined with cathartics and general tonics. [The remedy on which Dr. Granville chiefly relies, is a gargle containing lunar caustic; the strength of which should be varied, according to the state of the uvula itself, and the nervous irritation in the system. Another useful application, mentioned by the same physician, is a powder composed of equal parts of muriate of ammonia and nitrate of potash, with a quarter of Cayenne pepper. This produces great immediate irritation, followed by copious salivation, and expectoration of thick mucus. The powder should be rubbed on, with a camel-hair brush, twice or thrice a day. Gargles, made with a proportion of sulphuret of potash, are in common use among professional singers, for improving the defect of their voices, connected with relaxation of the uvula; and Dr. Granville thinks the practice justified by analogy; sulphuret of potash being known to have, in croup, the power of converting the stridulous voice into a deep full tone, and being in fact the remedy for which Bonaparte awarded a prize of 1000 Napoleons, during the epidemic croup which raged in Paris, in 1812.* If the disease do not yield to this plan, the elongated and pendulous part must be extirpated.

In a few rare instances, the uvula, and even the tonsils, become hard and cartilaginous; and, in such cases, the morbid portion must be cut away.

The uvula in its natural state appears also to be concerned in deglutition; and, [as one of its purposes is to examine, as it were, the nature of the aliment previously to its being swallowed, and by its sympathetic relations to excite an aversion in the gastric organs to substances not of a fit consistence and quality to be conveyed into the stomach, it is endued with a much higher degree of sensibility than the rest of the soft palate. By means of this quick sensibility, and the sympathy of the rest of the organs of deglutition with it, they are in all probability excited duly to perform the harmonious and successive actions by which the function of deglutition is accomplished.] And hence, when, from ulceration or any other cause, the uvula is lost or deficient, deglutition is rendered more or less troublesome, and even difficult. In this case, the healing art can administer nothing, and habit becomes the only physician. Examples are related, however, of so total a loss of the uvula, from gangrene, or the barbarous cruelty of cutting out the tongue, that the sad sufferer has been compelled to force the food

* In syphilitic ulceration of the soft palate, the uvula is often considerably enlarged, and so distended with serum, that it exhibits quite a transparent appearance. One gentleman, whom the editor lately attended, was in the habit of making a forcible expiration to throw the uvula in this state forward, for the purpose of its being inspected. Andral states, that œdema of the uvula may be idiopathic, connected with certain kinds of angina, or accompanying induration of the tonsils.—(Anat. Pathol., t. ii., p. 236.)—Ed.

* Lancet, No. 377, pp. 280, 281. According to Dr. Granville, who was for several years physician to the opera company, the uvula, in deep base singers, is thick and corneous, but thin and very pointed in the light, silvery, soprano singers. The observations of M. Bennati leave no doubt that the uvula and soft palate have considerable influence over the modulation of the voice; and he has demonstrated that these organs contract in proportional degrees to the ascent of the several musical notes.—(See Annali Universali for June, 1830; Bulletin des Sciences Méd., for May, 1830; and Lancet, No. 377.)—Ed.

in every meal into the œsophagus with his forefinger.*

SPECIES V.

DYSPHAGIA LINGUOSA.

LINGUAL DYSPHAGIA.

SWALLOWING OBSTRUCTED, OR TROUBLESOME, FROM PROTRUSION OR MAGNITUDE OF THE TONGUE.

THIS species exhibits itself under the two following forms or varieties :—

α Exsertoria. Lolling tongue.	Tongue extended from the mouth, often with enlargement of its substance.
β Ranula. Frog-tongue.	Intumescence of the salivary glands or ducts.

It is necessary, as in the last species, to distinguish both these affections from inflammatory enlargements. [According to the editor's views of this subject, the only cases which strictly accord to the author's classification, are certain chronic,† and frequently congenital, enlargements of the tongue; for the examples produced by mercury and poisons, though included in this section, are in reality inflammations, and ought therefore to be arranged with other cases of inflammation. Galen mentions an instance of a prodigiously large tongue, which was neither in a scirrhous, œdematous, nor inflamed state. —(Lib. i., cap. 9, de diff. morb.) Scaliger also refers to a man, whose tongue was of so extraordinary a size, *ut mendacii suspicio silentium indicat.*—(*Exercit.* 199, cap. 1.) Marcellus Donatus was acquainted with a merchant at Mantua who was in the same condition.—(*Hist. Mirab.*, lib. vi., cap. 3.) T. Bartholine quotes a case communicated to him by J. Valæus, in which a girl's tongue was as thick as her arm, and required to have a portion of it removed. The same author likewise describes a child, whose tongue, which was from the first larger than those of other children, became at length equal in size to a calf's heart.—(Cent. 2, *Hist. Anat.*, 22.) Similar instances of spontaneous preternatural growths of the tongue are recorded by Bardet (*Bulletin de la Soc. d'Erreux*, No. 23, p. 67) and Maurant.—(*Journ. de Med.*, an 1762, tom. xv.) Another example of congenital enlargement of the tongue is described by Percy. The malformation had increased so much by the time the patient reached her eighteenth year, that it was impossible to see the sides and under surface of the tongue; and though she could speak and sing, she was obliged to push her victuals to the back of her mouth with her fingers, in order to be able to swallow them. —(*Dict. des Sciences Méd.*, tom. xxvii., p. 246.) A very interesting case is that of Philibert Hænhumer, who was born with a very large tongue, pendulous from the mouth. No material increase of the part was afterward perceived till the boy was eight years of age. At this period it was of a purple colour, and covered with a thick, foul coat of mucus. It descended three inches below the chin; its apex was rounded; the teeth of the lower jaw were displaced by it; its base was two inches and a half thick; and the whole cavity of the mouth was filled by it; so that respiration could only be carried on through the nostrils, and nothing but liquids could be swallowed. The patient was relieved by the amputation of about a pound of the tongue, and the extraction of the misplaced teeth.—(*MM. Percy and Laurent*, vol. cit., p. 246.)

In another very similar case, nearly an English pound of the tongue was extirpated with ligatures by Dr. Mireau. In this instance, not only did the four lower incisor teeth project with their edges forward in the horizontal position, but the alveolary process was also displaced.

It is justly remarked by MM. Percy and Laurent, that cases of the above description must all be referred to the principle by which other lusus naturæ and extraordinary congenital enlargements of parts are produced; and that they are widely different from the instances more commonly recorded, which are specimens of glossitis, and generally occasioned by acrid, venomous substances, inflammation, or, what used to be termed metastases. In many of the congenital cases, however, it appears, that a further increase of the tongue proceeded from the irritation of the part by the teeth of the lower jaw, and the consequently augmented determination of blood to it.

Besides the impediment to deglutition, the enlarged and protruded state of the tongue gives rise to a constant loss of saliva, with which the victuals are therefore not duly impregnated; digestion is impaired, and the health suffers.

The operation of removing the redundant

* The simple loss of the uvula would scarcely create so complete an inability to swallow as what is here described. Many persons who have lost the whole of the uvula from syphilitic ulceration, continue to swallow without inconvenience. Cutting out the tongue in the rude way referred to in the text, would certainly render deglutition more or less difficult; but would not generally be accompanied by the excision of the uvula; nor, if such excision took place, would the dysphagia depend much upon it, but upon the loss of the tongue.—ED.

† In scirrhous disease within the mouth, while the cellular tissue is becoming more and more thickened and indurated, the other tissues around it often have a tendency to waste away; they become less and less visible, and at length disappear, their place being supplied by a hard, homogeneous, white or grayish mass.—(Andral, Anat. Pathol., tom. ii., p. 237.) This fact has been particularly noticed by Sir Charles Bell, and also by Dr. Hodgkin, in his valuable paper upon adventitious structures.—(See Med. Chir. Trans., vol. xv., p. 225.) In one case of scirrhus of the tongue, this organ, which was enlarged and singularly hard, presented nothing but a whitish substance, resembling the indurated cellular substance surrounding old ulcers of the skin, and in the midst of which some traces of slender, pale, muscular fasciculi were noticed, nearly obliterated by the pressure of the thickened cellular tissue. This was very exuberant on the dorsum and edges of the tongue, where it formed knobs, on several of which the mucous membrane was in an ulcerated state.—ED.

portion of the tongue is the only means of relieving the above description of cases. Whether it should be done or not, must depend upon the degree of inconvenience caused by the swelling and size of the part. In cases of glossitis, on the contrary, this practice is quite improper; for, when they will not yield to the removal of their particular cause, and the employment of antiphlogistic treatment, one or more free and deep incisions in the dorsum of the tongue will generally afford prompt relief. The merit of making the efficacy of this method properly known to the surgical profession belongs to M. Delamalle, who wrote some interesting observations on the subject in the Mem. de l'Acad. de Chir.; but the practice was first introduced by Camérarius, Zacutus Lusitanus, and other older surgeons. In the modern periodical journals, we are constantly meeting with proofs of its success.—(See *Edinb. Med. and Surg. Journ.*, No. 92, p. 76.) Sometimes, however, the necessity for deep incisions has been superseded by bleeding from the raninal veins, blistering the throat, and other antiphlogistic measures.—(See *Edinb. Med. and Surg. Journ.*, No. 93, p. 451.) In one very singular instance, where the enormous swelling was confined to the left half of the tongue, and bounded by the middle line, the application of six leeches two or three times to the inflamed part produced a speedy subsidence of the swelling.—(*Graves, in Dublin Hospital Reports*, vol. iv., p. 43.) In all cases of obstructed deglutition by enlargement of the tongue, the use of elastic gum tubes for the conveyance of food and medicines into the stomach under urgent circumstances, should never be neglected.

M. Magendie, in the Bulletin of the Philomathic Society of Paris, for September, 1817, quotes the case of a Jew, who was able to double his tongue backwards, and plunge it with the greatest ease into the pharynx; and tells us of a boy who acquired the same power by imitating the Jew. The first efforts of the latter were unsuccessful; but at length he ruptured the frænulum, and a hemorrhage ensued, which, nevertheless, did not alarm him; for he found from that moment that he could pursue the imitation more perfectly; till, by continued repetition, he too acquired the singular faculty of swallowing, in the same manner, his own tongue, without the least inconvenience to his respiration.

But the substance of the tongue, under this variety, is not always enlarged. M. Fournier knew a handsome young woman, sixteen years of age, who, although she had a long neck, had a slender and still longer tongue, insomuch that she could protrude and extend it to her bosom without stooping her head. And he tells us of another female whom he saw at Berlin, with a tongue astonishingly wide, but as thin as a cat's. When this woman laughed, the tongue covered the whole of her mouth, and hung out like folds of drapery. It was always cold, and communicated a most frigorific sensation to the hand of another person.—(*Dict. des Sciences Médicales*, art. Cas Rares.)

[The Ranula, or *frog-tongue*, is a tumour under the tongue, consisting sometimes of a dilatation of the excretory duct of the sublingual gland; sometimes of a dilatation of the excretory duct of the submaxillary gland. The first case is denoted by its globular shape, and its situation exactly under the tongue; the second by its oblong figure, and its lying towards the side of that organ. The disease is most frequent in children; but is also met with in adults. The contents of the swelling are generally a viscid, transparent fluid, like white of egg. The disease arises from an accidental obstruction or obliteration of one of the above-mentioned ducts. When neglected, the tumour sometimes becomes so large that it occupies the greater part of the mouth; forces the tongue backwards; impedes suction, mastication, and deglutition; obliges the patient to breathe entirely through the nostrils; propels outwards the canine and cutting teeth; and even forms a prominent swelling below the chin.—(See *Petit, Traité des Mal. Chir.*, tom. i., p. 184.)

When the tumour is recent, and not very large, it may be cured by making a free opening in it, and maintaining the aperture for some time by means of a small tube or tent. When, however, the swelling is of a considerable size, and of long standing, and the cyst is thick and indurated, a portion of the latter part must be removed.]

The irritation and enlargement proceed occasionally from a morbid secretion of calculous matter. Hence, when a ranula has been opened, the surgeon should always examine with a probe whether any calculous matter is lodged in it; and, if it be so, it should be at once extracted. M. Fournier records one case, in which a stone formed under the tongue, and at length acquired the size of a pigeon's egg, accompanied with great pain and profuse salivation: a cure was effected by removing the morbid concretion

SPECIES VI.

DYSPHAGIA PHARYNGEA.

PHARYNGEAL DYSPHAGIA.

SWALLOWING OBSTRUCTED BY A POLYPOUS EXCRESCENCE IN THE PHARYNX.

The variety, produced by a polypous excrescence in the pharynx, is added. Sir Astley Cooper tells us that he has seen two cases of it; one in a Spanish gentleman who had previously consulted various surgeons at Paris, but apparently without success. It was of the colour of the mucous membrane of this portion of the alimentary tube, beginning from the fold over the palato-pharyngeus, and hanging down like a sausage into the pharynx. By great efforts the patient could regurgitate it into his mouth. A ligature was passed round its root without much difficulty, and it separated in eight days. The second case was similar in appearance, but not quite so large, and grew still more from the root of the tongue. It was removed in the same manner, and with equal success.*

* Lectures on Surgery, vol. ii., p. 356, 8vo., 1825. This addition was found among Dr. Good's papers, subsequently to the completion of the third edition.—Ed.

[The particulars of another instance of a difficulty of swallowing, from the growth of a polypus from the lining of the pharynx, were communicated, two or three years ago, by Kergaradec, to the Royal Academy of Medicine at Paris.—(*Dict. de Méd. et de Chir. Pratique*, art. *Dysphagie.*) The true cause of the dysphagia, which had been treated as a nervous affection, was only made out after death, when the parts were dissected.]

GENUS IV.
DIPSOSIS.
MORBID THIRST.

THE DESIRE FOR DRINKING EXCESSIVE OR IMPAIRED.

BETWEEN the present and the ensuing genus, entitled LIMOSIS, or MORBID APPETITE, there is a close natural connexion, though their position is in different and even distinct organs.

The sense of hunger is well known to be seated in the stomach; and that of thirst in the mouth and fauces. [Thirst is a feeling of a still more urgent kind, and requiring instant satisfaction still more imperiously, than hunger; particularly in warm climates, or when any of the watery secretions are augmented, as in dropsy and diabetes. It is one of the most distressing symptoms in fevers and inflammatory complaints, especially in inflammation of the stomach. Hot spices, saline substances, and, in particular, common salt, increase it, as do all causes augmenting the different secretions. The end of drinking seems, therefore, to be for the repair of the losses of our fluids. If thirst be not satisfied, a general irritation comes on; the sensation of dryness in the mouth and fauces increases, and is accompanied with a burning feel, and a quickened pulse. But, although thirst appears at first very oppressive, drink is by no means so necessary to the continuance of the life of every animal, as food. Several species of warm-blooded animals, as mice, quails, parrots, &c., can subsist without drinking; and individuals of the human race have been known, by perseverance, to conquer the sensation of thirst. Sir G. Baker has recorded a memorable example, in the Transactions of the College of Physicians, of a man, who lived in perfect health for many years, without drinking.

Thirst and hunger may be compared to two sisters, united together for the common purpose of rendering the animal attentive to the preservation of its own existence. When their call is obeyed, they are a source of pleasure; when it is neglected, or resisted, they are a cause of great and even fatal suffering. But, in the production of these two very different results, pleasure and pain, thirst is far more energetic and intense than hunger. The quickness with which the taking of drink appeases the first of these sensations, contrasted with the slowness with which solid aliment is necessarily conveyed into the stomach, perhaps, may tend in some measure to explain the really greater enjoyment generally felt in quenching thirst than in satisfying hunger.

In the great object for which thirst and hunger are instituted, namely, the nourishment of the body, the importance of the latter sensation is sometimes represented as greater and more evident than that of the second. Solid aliment, it is said, yields the essential constituent parts of the blood; and the utility of drinks, in relation to this fluid, is not always so manifest. Yet, how can this view be adopted, unless we shut our eyes to the large proportion of aqueous fluid in the blood, and to the immense quantity of water continually thrown out of the circulation by the lungs, kidneys, skin, and the secreting organs in general? The cessation of pleasure, however, the crisis to which the satisfying of either of these sensations leads, it is true, is less strongly marked with respect to thirst than hunger; and the disgust, experienced from cramming the stomach with solid food, can scarcely be said to be producible by taking a redundant quantity of beverage. Indeed, with regard to thirst, drunkards appear incapable of reaching that point which, in the use of solid aliments, may be regarded as satiety. This difference probably depends upon the stomach immediately ridding itself of drink, while chymification requires the food to be retained in it a considerable time. Hunger and thirst differ strikingly from one another in the time and situation of their development, as well as in their local and general phenomena. Thirst, contrasted with hunger, comes on suddenly, and, if it be not quenched, it creates a state of suffering,—real pain; it is not at all like what, in relation to hunger, is called an appetite, which enters into the class of agreeable sensations. In thirst, the mouth, and especially the throat, are affected; in hunger, the stomach is the seat of uneasiness. Thirst, even when not very ardent, is accompanied with a true local and general excitement; while hunger, if at all protracted, occasions chilliness, paleness, and a disposition to fainting. The differences between hunger and thirst, when long continued, and assuming the character of diseases, or rather, between the effects of a total abstinence from drink and those of a complete abstinence from solid food, are still more strongly marked. To use a term employed by Brown, the state of *sthenia*, of erethismus, of dryness, and of local and general heat; the increased activity in the general and capillary circulations; the energy of the external senses, of the whole nervous system, and of the muscular organs; the results of thirst, form a very manifest contrast to the prostration of every power of the constitution, to the languor of all the functions, and to the true adynamia, produced by unappeased hunger. Death, which is the end of both these scenes, takes place much sooner from thirst, and the more so, because no remission occurs in the cruel and progressive course of its symptoms. Death from want of solid food always comes on more tardily, and its phenomena, which are characterized by irregular paroxysms, are attended with remissions of greater or less duration.

But nothing is a better illustration of the dif-

ferences between hunger and thirst, than the influence of disease over them. Who does not know, that one of the first effects of most diseases is to augment thirst, and to make the patient need a larger quantity of drink, while the appetite is more or less completely annihilated, and a necessity for abstinence produced? Throughout the course of diseases, while thirst continues, the appetite cannot return; and even if it were to do so, in this state of things, it would only be a fallacious indication of a fictitious want, that could not be safely satisfied. The decline of indisposition, and the approach of convalescency, denoted by the subsidence of thirst, have also, as one of their surest harbingers, the return of appetite. And with regard to therapeutic means, is it not equally a fact, that beverages which assuage thirst create appetite? that certain medicines, particularly antispasmodics and opium, which diminish hunger, excite a good deal of thirst? and, lastly, that all generous alcoholic wines which appease or delude the sensation of hunger, produce at the same time quite an opposite effect upon thirst?

Though the seat of thirst is now generally assigned to the mouth and fauces, some physiologists so far dissent from this doctrine as to refer the seat of thirst partly, also, and even principally, to the stomach. They argue, that, as this organ is the instrument of hunger, it must, by analogy, be likewise that of thirst; and that heating drinks and food, which merely glide over the throat, produce thirst chiefly by their action on the stomach, as is proved by the circumstance of thirst not being felt till digestion is going on in the stomach, and long after their application to the pharynx. They further argue, that the thirst following a meal, is actually quenched by beverages which merely touch the parts in the mouth and throat momentarily, but remain more or less time in the stomach. They likewise take into consideration, that various aliments of mild qualities, like farinaceous substances, which do not at all irritate the pharynx in deglutition, excite a considerable degree of thirst after their introduction into the stomach. The only means of relieving thirst so brought on, is to swallow plenty of fluid; for every other attempt at deceiving the patient's feeling is to little purpose.

It is conceived that other observations tend to raise additional uncertainty respecting the true seat of thirst. Dropsical diseases, diabetes, profuse suppuration, copious hemorrhages, &c., are cases in which the animal economy is deprived of a large quantity of fluid, without the physical state of the pharynx or stomach appearing to be more particularly affected, than any other part of the body. Nay, it is asserted, that some rare examples have been met with, in which an irritation, a dryness, and redness of these organs, were not accompanied with the least degree of thirst; and it is remarked that, whatever may be the cause and intensity of this sensation, it may certainly be appeased by the warm bath, clysters, and the injection of liquid into the veins; plans which replenish the system with fluids, but have no specific action either on the throat or stomach.

Although these reflections seem to the editor to bear more upon the question concerning the causes of thirst, than that relating to its seat, they are highly interesting, confirming the fact, that the present subject is involved in a great deal of mystery, and pointing out the obscurity that attends our internal sensations, compared with such as are derived from without.

Many vague hypotheses have been suggested, as explanations of the immediate cause of thirst. The least plausible ones must here be passed over in silence. By some physiologists, thirst is imputed to the dryness of the nervous papillæ of the pharynx, arising from a diminution of the salivary and mucous secretions. Yet, in numerous cases, thirst exists quite independently of a want of moisture in the pharynx; while such beverages as are calculated to prevent the dry state of that organ do not always succeed in quenching thirst; and, in many instances, the best means of assuaging it, whatever may be its violence, are certain general therapeutic plans, which cannot possibly operate by moistening the pharynx, or its nerves.] In thirst, there is, perhaps, always a sense of dryness in the fauces; and yet dryness of this organ does not appear to be the cause of thirst; at least, the intensity of the feeling does not appear to depend on the intensity of the dryness: for there is sometimes but little thirst, where the tongue, to its very roots, is covered with a thick and dry crust, as in the acme of continued fevers: while it is often vehement under the influence of violent passions, and intolerable on a surcharged stomach, when the tongue and fauces have no dryness whatever.

[Another class of physiologists, considering, on the one hand, the purpose of thirst, which leads us to take only such fluids as are fitted to dilute the blood and the secretions; and observing, on the other, the powerful influence that copious evacuations, by perspiration, diarrhœa, diabetes, and serous extravasations, have over this sensation, attribute the immediate cause of thirst to the abstraction of the aqueous part of the blood. Bichat, who was inclined to adopt this theory, conjectured that the introduction of water into the veins would, by mixing with the venous blood, have the effect of quenching thirst in the same manner as drink taken in the ordinary way. This conjecture is now ascertained to be a fact. By injecting water, milk, whey, and other fluids into the veins, Baron Dupuytren has frequently appeased the thirst of animals subjected to experiment, and long exposed to a burning sun. By varying such experiments with liquids known to be agreeable or disagreeable to dogs, he found, that the animals derived from these liquids, so employed, the same sensation of taste as if they had been given by the mouth. In fact, when milk was thrown into the jugular vein, the dogs made a lapping motion, just as if they were really taking the milk up with their tongues.

Some analogous experiments were made by Professor Orfila. In his valuable researches on

Toxicology, he had frequent occasion to tie the œsophagus in dogs, in order to hinder the expulsion of poisons which they had swallowed. For the purpose of appeasing their thirst, excited by the fever resulting from the extensive wound in their necks, he injected water into their jugular veins. This method of quenching thirst, the only one practicable while the œsophagus was tied, was performed in a great number of instances, and always gave immediate relief. The blood of animals which had been long in a thirsting state, was also submitted to distillation, and the diminution of its aqueous part was always found to be in proportion to the length of their abstinence from drink.—(*Dict. des Sciences Méd.*, tom. li., p. 469.) The principal fact interfering with the foregoing theory, is that of the frequently sudden production of thirst, without any previous abstinence from drink, sufficient to justify the suspicion of the watery part of the blood having been in any way particularly lessened. But although much obscurity prevails concerning the efficient cause of hunger and thirst, their final cause is sufficiently obvious; they are the means by which we are warned of the necessity of supplying the system with materials requisite for its existence. They belong to that class of actions which are termed appetites; where an effect, which is a compound of a physical and a mental operation, is connected with an evidently useful purpose in the animal economy.]—(*Bostock's Physiology*, vol. ii., p. 531.)

The common modes of quenching these agonizing sensations, are well known to be eating and drinking; yet, when these cannot be indulged in, other modes may answer as a substitute. Thus, violent pressure against the coats of the stomach, whether externally or internally, is well known to take off the gnawing sensation of hunger; and stimulating the fauces, to take off the burning faintness of thirst. It is on this last account that chewing a mouthful of hay, alone, or merely moistened with water, proves so refreshing to a tired horse, and is found so serviceable when we dare not allow him, in the midst of a long stage, to slake his thirst in the natural way. Savages and savage beasts are equally sensible of the benefit of pressure in the case of hunger, and resort to it upon all occasions where they have no opportunity of taking off the pain in the usual way. The manis, or pangolin, that swallows its food whole, will swallow stones, coals, or any other substance, if it cannot obtain nutriment; not that its instinct deceives it, but for the purpose of acquiring such a pressure as may blunt the sensation of hunger, which it finds intolerable. Almost all carnivorous beasts pursue the same method; and a mixed mass of pieces of coal, stone, slate, and earth, or other hard materials, is often met with in the stomach of ostriches, cassowaries, and even toads. The Kamtschadale obtains the same end by swallowing sawdust; and some of the northern Asiatic tribes, by a board placed on the region of the stomach, and rudely laced behind with cords, drawn tighter and tighter, according to the urgency of the uneasiness. In our own country, we often have recourse to a similar expedient, and only exchange the tightened stomach-board for a tightened handkerchief.*

It is possible, therefore, temporarily to overcome these natural sensations without the natural means; and the passions of the mind have as strong an influence on both as any of the substitutes just adverted to. Thus both are completely lost beneath the sudden communication of news that overwhelm us with grief or disappointment. So Van Helmont tells us that, happening to dislocate his ankle while walking with a good appetite to dine with a friend, his appetite immediately forsook him, but returned as soon as the joint was replaced, though the pain continued for some time with little alteration. There are some passions, however, as those of rage and eager desire, which, while they repel the sense of hunger, increase that of thirst. But they prove equally the close connexion of both feelings with the state of the nervous system generally, and the strong and extensive influence which is sympathetically exercised over them.

Morbid thirst, as a genus, is new to the science of Nosology, and hence the two species which belong to it have hitherto, in almost every instance, been separated from each other, and thrown loosely into remote parts of the classification. Dr. Young, however, offers an exception to this remark; for, with his accustomed accuracy, he has united them under a common head. The genus being new, it has hence been necessary to create a new name for it; and that of dipsosis, from *διψαω*, "to thirst," has appeared not only most pertinent, but most consonant with the nomenclature in common use, which has naturalized various terms derived from the same root; as adipsia, polydipsia, phobodipsia, this last being a synonyme for hydrophobia.

The two species of the genus are the following:—

1. Dipsosis Avens. Immoderate Thirst.
2. ——— Expers. Thirstlessness.

SPECIES I.

DIPSOSIS AVENS.

IMMODERATE THIRST.

CONSTANT DESIRE OF DRINKING, WITH A SENSE OF DRYNESS IN THE MOUTH AND THROAT.

Simple thirst is a natural, immoderate, or inextinguishable thirst,—a morbid feeling. Yet even the latter is less frequently an idiopathic

* Capt. Kennedy, who was shipwrecked in 1769, relieved his thirst by soaking his clothes twice a day in salt water, and putting them on without wringing. He says (Dodsley's Ann. Reg., 1769), "After these operations the violent drought went off, and the parched tongue was cured in a few moments after bathing and washing our clothes; and at the same time, we found ourselves as much refreshed as if we had taken nourishment. Four persons in the boat who drank salt water, became delirious, and died; but those who avoided this, and followed the above practice, experienced no such symptoms."—D.

disease than an individual symptom of some other complaint, or some peculiar state of body, the removal of which will alone effect its cure. [Whether, in the strictest sense of the expression, immoderate thirst is ever an original idiopathic disease, appears to the editor very doubtful; and in the cases where it has been assumed to be so, probably this inference was drawn merely from the circumstance of no other disorder in the system being apparent. How often, however, is the practitioner compelled to observe only symptoms, and remain ignorant of their primary cause!]

I have at this time under my care a young lady of about thirteen years of age, in other respects in good health, who is tormented with a thirst so perpetual, that no kind or quantity of beverage seems to quench it for more than a few minutes. Emetics and other purgatives have been tried in vain. Squills and other nauseating expectorants seem to promise more success. It has now lasted for several weeks.

The most grateful palliatives are the vegetable acids, and especially acescent fruits, and a decoction of sorrel-leaves (*rumex acetosa*, Lin.) slightly inspissated with gumarabic or some other mucilage, and sweetened to meet the palate. Liquorice, which, among the Greeks, had so high a reputation for quenching thirst as to be honoured with the name of ἀδίψιον, "the thirst extinguisher," has little or no effect. And it is probably true, as suggested by Dr. Cullen, that it only acts in this manner when the root is well chewed, by which means the salivary excretories become stimulated to an increased secretion of fluid.

In a foreign medical miscellany we have reported to us a case of the same kind, brought on by drinking a cold beverage during the paroxysm of a fever, that continued for more than a twelvemonth.—(*Heuermann, Bemerkungen*, i., p. 28.) And in another foreign journal, we have an account of this disease as epidemic among children.—(*Gazette de Santé*, 1777, p. 93.)

The quantity actually drunk is sometimes enormous. Four hundred pints of wine and water have, in some cases, been swallowed daily.

As a symptom, excessive thirst is chiefly found in the hot fit of fevers, in dropsy, dysentery, diabetes, diarrhœa, and other discharges. It is also frequently excited in wet-nurses, as soon as the child takes hold of the nipple; but perhaps is felt most intolerably under the torture inflicted to compel a confession of guilt; in which case it is said to form the worst part of the suffering. The agony of violent thirst, brought on by bodily suffering, is well depicted in the description of the fatal scene in the memorable Black Hole of Calcutta.—(*Annual Register*, 1758.)

* A case, however, occurred within the observation of Drs. Hosack and Francis, of a gentleman then aged about 35 years, who had no recollection of having ever experienced the sensation of thirst. He had long enjoyed good health, and was very muscular; even when using excessive quantities of stimulating condiments, as cayenne pepper, &c., he had no desire for fluids. In those who confine themselves to vegetable food exclusively, the disposition for drinks is much diminished. The case of Mr. Waterton, the distinguished traveller, is an instance of this kind.—D.

† Blumenb. Physiol., sect. xxi., 322. J. W. Neergaard, Vergleichende Anatomie und Physiologie des Verdauungswerkzeuge, &c.

SPECIES II.

DIPSOSIS EXPERS.

THIRSTLESSNESS.

CONSTANT WANT OF THIRST.

CONSIDERING that thirst is a natural feeling, and contemplating the vehemence of this feeling when extreme, it is not a little extraordinary that instances of its total absence should ever occur. Yet there are many animals, and warm-blooded animals too, that never require drink, and consequently never thirst; as mice, quails, parrots. Here, however, the want of thirst, or desire to drink, is a natural condition in the economy of these animals. In man, and animals constituted like man, with a constitutional proneness to thirst, and an instinctive urgency to quench it by drinking, this want of desire can never take place without disease.* [Whether this, however, should be referred to disease, or a natural idiosyncrasy, may be questionable. While immoderate thirst, unattended with any other manifest disorder of the constitution, has been set down by nosologists as an original idiopathic disease, thirstlessness, we perceive, is not viewed in this light, but regarded here as an effect of disease. In opposition to this conclusion, it should be recollected that some individuals have lived, seemingly in good health, without drinking. M. Bouffard records one instance in which a young lady, twenty-two years of age, passed whole months without drink, yet appeared to be well in every other respect.—(*Dict. des Sciences Méd.*, tom. li., p. 465.) Facts of the same kind are reported by Sir G. Baker.] —(*Med. Trans.*, vol. ii., p. 265, &c.) Cases of thirstlessness are not by any means frequent. Sauvages mentions two instances that occurred to himself. In the one, the patient, a learned and excellent member of the Academy of Toulouse, never thirsted, and passed months at a time without drinking, even in the hottest part of the summer: in the other, the patient, who was a female of a warm and irascible temperament, abstained from drinking for forty days, not having the smallest degree of thirst through the whole of this period.—(*Nosol. Method.*, vol. i., p. 770, 4to edit.) Neergaard, as quoted by Blumenbach, has furnished us with other examples;† and M. Fournier informs us that one of his most intimate friends reached, not long since, the age of forty-eight, without ever having drunk of any fluid, or been thirsty; but he was accustomed to eat voraciously. It is singular that he should have died of *dropsy* of the chest, apparently the result of a second bleeding for some accidental malady.—(*Dict. des Sciences Médicales*, art. CAS RARES.)

GENUS V.
LIMOSIS.
MORBID APPETITE.

THE APPETITE FOR FOOD IMPAIRED, EXCESSIVE, OR DEPRAVED.

THE sensation of hunger, as observed already, is seated in the stomach, and, like that of thirst, is a natural or instinctive desire.* It may, however, become diseased, and lose its natural character; and this in various ways, and accompanied with various sets of symptoms, each of which lays a foundation for a distinct species. Like the species of the last genus, however, they have hitherto been omitted in most nosologies, or loosely scattered over different parts of the classification, though they evidently belong to a common family, and should be contemplated in a concentrated view. It is for this purpose they are now united under the banners of a single genus, to which I have ventured to give the name of LIMOSIS, from λιμος, "hunger," being the root of various terms current in the medical vocabulary; as, bulimia, alimia, alimon, alimonia, alimentum; though the last three have been commonly misderived by the lexicographers from *alo*, "to nourish;" unless *alo* itself be from the same source.

The species that properly appertain to it are the following:—

1.	Limosis Avens.	Voracity.
2.	——— Expers.	Long Fasting.
3.	——— Pica.	Depraved Appetite.
4.	——— Cardialgia.	Heart-burn, Water-Brash.
5.	——— Flatus.	Flatulency.
6.	——— Emesis.	Sickness, Vomiting.
7.	——— Dyspepsia.	Indigestion.

SPECIES I.
LIMOSIS AVENS.
VORACITY.

INSATIABLE CRAVING FOR FOOD.

THIS affection may be produced by a sense of faintness and inanition, without any known cause of exhaustion; probably in consequence of some organic error in the stomach by gluttony, or an habitual indulgence in large and frequent meals; or by exhaustion from hard exercise, long fasting, fevers, or excessive discharges: thus offering the three following varieties of this species:—

α Organica. Canine appetite.	From a feeling of faintness and inanition.
β Helluonum. Gluttony.	From an habitual indulgence in large and frequent meals.
γ Exhaustorum. Hunger of exhaustion.	From exhaustion, as the consequence of hard exercise, fevers, or excessive discharges.

* Dr. Beaumont (Exp. and Obser. on the Gastric Juice, &c.) considers the sensation of hunger to be produced by a distention of the gastric vessels, or of the vascular or glandular apparatus, which secretes the gastric juice.—D.

There are many persons who from birth, or a particular period of life, without any habit of indulgence, are capable of taking into the stomach an enormous quantity of food, and cannot be satisfied without it, from a constant sense of faintness and inanition; and who by no means increase in bulk in proportion to the quantity swallowed; being often, on the contrary, slender and emaciated.

It is difficult to account for this effect in every case; but there is great reason to believe, that, in general, it depends upon some error in the structure or position of the stomach, by which means the food passes out of this organ as soon as it is introduced into it. [A very curious example of an approach of the stomach to the perpendicular direction, attended with a singular structure of that organ, has been lately recorded by Mr. Hart; but, unfortunately, the particulars of the appetite and digestion in this subject could not be ascertained.*] Ruysch gives a case, in which the diameter of the pylorus was considerably enlarged from relaxation; and there are others, in which it has been changed from its natural to a lower or dependent position, in consequence of the left side of the stomach being elevated by a dropsy of the ovarium, or an enlargement of the liver. The existence of a double stomach, or of an immediate insertion of the ductus communis choledochus into the stomach, though noticed as causes by Blasius and Bonet, is more doubtful.† In the hunger of general exhaustion, forming our third variety, we know it to be produced by the secretion of an extraordinary quantity of gastric juice, by which the food is digested almost as soon as it reaches the digestive organ. That mimic feeling which is commonly known by the name

* See Dublin Hosp. Reports, vol. iv., p. 326, &c.

† In a galleyslave, noted for voracity, Vesalius ascertained that the bile was poured directly into the stomach. The stomach of the celebrated glutton, Tarrare, of whom some particulars will presently be detailed by Dr. Good from the history published by M. Percy (see Mém. sur la Polyphagie, Journ. de Méd., &c., par MM. Corvisart, Leroux, &c., t. ix., p. 87), was remarkable for its great capacity. In the instance recorded by Cabrol, in which the bowels were only three feet long, the size of the stomach was prodigious. On this subject, Professor Andral puts a judicious question; viz., whether the extraordinary dimensions of the stomach, sometimes noticed in the bodies of persons known to have been gluttonous eaters, may not be the simple effect of the immoderate quantities of food habitually introduced into that organ, and not the primary cause of the voracious appetite itself? In this case, it might be expected that the stomach would increase in bulk, like all other parts whose functions are in a state of considerable activity.—(See Andral's Anat. Pathol., t. ii., p. 192.) However, in one remarkable instance of extraordinary congenital bulimia, reported in a modern work, the stomach, instead of being increased in size, was found after death particularly small, though the individual lived to the age of thirty-two.—(See Broussais, Annales de la Méd., Oct., 1832.)—ED.

of *false appetite*, was supposed by Galen to be produced by some acrimony in the stomach. Upon the theory of Dr. Wilson Philip (*Treatise on Indigestion*, &c., p. 73, 1824), its real cause should be an excessive secretion of gastric juice itself; for it is the flow of this material over the interior of the tunic of the stomach, that, according to him, excites the sense of hunger. It should, however, be recollected, that, if this sensation be not indulged within a few hours, and in weak stomachs within a much shorter period of time after its commencement, it suddenly dies away, and is succeeded by anorexy; although it is reasonable to suppose, that there is then in the empty stomach a much larger quantity of the secretion.

[Some cases of voracious appetite seem explicable on another principle, connected with the theory frequently entertained of the proximate cause of hunger, namely, that it is a sensation excited in the stomach by sympathy with the wants of the constitution at large. Thus, it is often noticed in young persons, who are growing with great rapidity, and in pregnant females; examples, as Andral truly observes (*Anat. Pathol.*, t. ii., p. 192), strongly illustrating the necessity of frequently searching for the cause of a functional disorder far from the organ which is the seat of it. If any circumstance impede the nutrition of the body, hunger still remains, although the stomach be distended. Thus, in a case recorded by Morton, where the thoracic duct was ruptured, the child died in a horrible state of marasmus, notwithstanding it was continually taking enormous quantities of food to appease the violent cravings of its hunger. The excessive voracity of persons afflicted with a scirrhous pylorus (see *Monro's Morbid Anat. of Human Gullet*, &c., p. 334), or with disease of the mesenteric glands, is well known. In a very interesting case recorded by M. Gondret, where the whole of the stomach was thickened by scirrhus, and its capacity so reduced that it was scarcely capable of holding eight or ten ounces of fluid, the patient suffered much from a continual and painful sensation of hunger.—(*Magendie, Journal de Physiol. Expér.*, tom. i., p. 281.) The same fact is also exemplified in individuals whose intestinal canal is preternaturally short, as in the remarkable example described by Cabrol, where the length of intestine, between the pylorus of an enormous stomach and the anus, did not exceed three feet. And even in convalescents, sadly emaciated by severe diseases, and whose appetite is sometimes almost insatiable, it seems as if a full state of the stomach could hardly lull the general feeling of inanition. The present affection sometimes comes on merely as one of the symptoms of certain degrees of chronic gastritis. In this case, no sooner is a small quantity of food introduced into the stomach, than a complete loss of appetite succeeds the irresistible craving previously experienced, and various dyspeptic complaints follow. Many patients affected with chronic gastritis, feel an oppressive dragging sensation in the epigastrium, which is mistaken for hunger.]

Whatever be the cause, the quantity of food devoured by persons labouring under this affection is enormous, and in some instances almost incredible. Dr. Mortimer (*Phil. Trans.*, vol. xliii., p. 366) relates the case of a boy only twelve years old, who, from a feeling of inanition, had so strong a craving that he would gnaw his own flesh when not supplied with food: when awake, he was constantly eating: the food given him consisted of bread, meat, beer, milk, water, butter, cheese, sugar, treacle, puddings, pies, fruits, broths, potatoes; and of these he swallowed, in six successive days, three hundred and eighty-four pounds eight ounces avoirdupois; being sixty-four pounds a day on the average. The disease continued for a year: and in this case we have a clear proof, that the feeling of hunger did not depend upon extraordinary secretion of gastric juice producing a rapid digestion; for the food was usually rejected soon after it had been swallowed, but whether without passing, or after having passed into the duodenum, it is impossible to say. And there are other cases, related by Lommius, of a similar kind.

In various instances, however, the food thus voraciously swallowed does appear to be digested, and that almost as soon as taken. Of this the case of the notorious Tarrare, as related to the National Institute by M. Percy, is a striking illustration. Before his enlistment, he was in the habit of devouring enormous quantities of the coarsest flesh, fruits, and roots; and, subsequently, he was found, after swallowing his own rations, to feed on the refuse of his comrades' messes, or offensive meat thrown on the dunghills; and to devour cats, dogs, and serpents. M. Fournier tells us, that, at seventeen years of age, when he weighed only one hundred pounds, he could devour in the space of twenty-four hours a quarter of beef as heavy as his body; and that, on one occasion, when in the army, he devoured in a few minutes a dinner prepared for fifteen German labourers, and composed of various substantial dishes. There is a singular story, that the French commander attempted to turn this wonderful voracity and extent of stomach to a good account, by employing it as a safe deposite for a letter of secrecy, which he wished to send to a French officer, at that time in the hands of the enemy. He sent for the man, showed him a wooden case containing the letter, and having put him into good-humour by treating him with thirty pounds of liver and lights, prevailed upon him to swallow it, and to depart with all speed to the enemy's quarters. Tarrare, however, was taken prisoner in the attempt; and while in prison, passed the box by stool before he could meet with the officer, but immediately swallowed it again, to prevent its falling into the enemy's hands. He was strongly suspected of cannibalism; and was often repulsed with difficulty from the ward appropriated to the dead. He at length fled from the army in consequence of a rumour that he had devoured a child sixteen months old, which had suddenly disappeared. The alvine evacuations of this man were not immoderate; but after

gorging his stomach he slept and emitted torrents of perspiration, a symptom common to the disease. He fell at length into a hectic, and died of marasmus.—(*Dict. des Sciences Médicales*, art. Cas Rares.)

Voracity is often a symptom of some other affection; it will sometimes occur in the most capricious manner during pregnancy, often in the middle of the night, or at some other unexpected period; when the patient, with a sudden sense of faintness and inanition, will perhaps devour an inordinate quantity of almost any food that can be obtained at the moment; though in many cases there is a fanciful longing for a particular kind, as for herrings, of which Tulpius (lib. ii.) gives an instance of a lady, who in this state devoured four hundred at a meal. In these instances, it is probable that the urgent desire becomes a stimulus to the secernents of the stomach, and that a greater quantity of gastric juice is in consequence poured forth.

In like manner, voracity and the sense of hunger occur also as a symptom in many cases of helminthia, or worms in the stomach or duodenum. But from the emaciation which usually accompanies such persons, it is most probable that the inanition or emptiness of the stomach is here produced, not by a rapid or elaborate digestion, but by an irritable state of the muscles of the stomach, which contract too readily, and force the food into the intestines before chymification has taken place. In the *Phil. Trans.*, Dr. Burroughs relates the case of a patient, who, from this cause alone, was rendered capable of devouring an ordinary leg of mutton at a meal for several days together, and fed greedily at the same time on sowthistles and other coarse vegetables.

The best means of treating idiopathic voracity must be as variable as the efficients that produce it. When we have reason to ascribe it to a morbid state of the stomach in respect to tone or secretion, purgatives, and especially those that are warm and bitter, as aloes, may be successful. Stimulating stomachics have been found equally so; whence Galen very judiciously recommends frequent and small doses of brandy, and Riverius, of ambergris. If these do not succeed, the stomach should be kept for some days in a state of constant nausea: and, with this view, as well as with that of destroying the morbid irritation on which the voracity depends, opium will often be found a highly salutary medicine. If the disease be produced by worms, or any other remote irritation, it can only be conquered by conquering the primary affection. And if it depend on a preternatural enlargement of the pylorus, a perfect cure is beyond the reach of art; though some benefit may be derived from strong external pressure.*

The second variety, resulting from a gluttonous habit, is far more common, and very readily produced; insomuch, that there is not perhaps a corporate town in the kingdom that does not offer abundant examples of it. It is, in fact, one of the numerous evils to which idleness is perpetually giving birth; for, let a man have nothing to do, and he will be almost sure, whenever he has an opportunity, to fill up his time by filling up his stomach: and hence the lazy train of servants that vegetate from day to day, almost without locomotion, in the vestibule, hall, and other avenues of a great man's house, eat three or four times as many meals as their masters, who may possibly be employed, from morning till evening, in the courts of law, the committee-rooms of parliament, or in a fatiguing maze of commercial transactions.

In tracing the cause of this voluntary disease, we have no difficulty whatever. When the stomach becomes accustomed to distention, it is never easy without it; and at length requires to be constantly full to be free from disquiet. It is also well known, that every sense grows more acute the more it is employed: and hence the taste and longing of the glutton become more alive to what is relishing and savoury; he enjoys such indulgences more than other men, and turns with disgust from foods that are plain and simple. On this account, the difference between the craving of a pampered appetite and that of real hunger is extreme: the former, whatever be its longing, can only satiate itself on delicious and high-seasoned dishes; the latter is content with a fare of any kind, and enjoys the plainest more than the richest.

By constant distention the capacity of the stomach may become enlarged, and not only hold, but require for satiety, a far more copious quantity of food than in its natural state; and hence one cause of that enormous bulk of the organ which has often been mistaken for dropsy. Bonet gives a case, in which, owing to a mistake of this kind, the patient was actually tapped, and the contents of the stomach hereby discharged, death following soon afterward. Magendie relates an instance that occurred to himself, in which the patient, then seventy-two years of age, vomited in a few minutes, from a stomach enormously distended, as much as filled two large pails.

It is not often that we are asked to attempt a cure of this complaint: it generally proceeds till the tone of the stomach is exhausted by its hard labour, and the cure is effected by the introduction of dropsy, or some other disorder worse than itself, which utterly extinguishes all appetite whatever. The man, nevertheless, who would honestly undertake to reclaim himself from this mischievous habit, and to acquire a better, should proceed in his career gradually; for organs that have long been under the influence of perpetual excitement, would lapse into atony upon the sudden adoption of a severe

* In a case under M. Rostan, in 1819, ice, administered inwardly, considerably abated for a time the fury of the patient's hunger.—(Med. Gazette for July, 1833.) Several pieces of tænia were afterward expelled by means of purgatives. As her hunger decreased, her appetite became depraved, so that she would devour the raw lights of slaughtered animals, and browse upon grass. —Ed.

counter-plan. The food should gradually be plainer, less in quantity, and repeated at a greater distance of time; while the intervals should be filled up with some pleasant and active pursuit, that may wholly engross the attention; for the surest way for such a man to produce faintness, flatulency, and uneasiness in his stomach, is to think about it. The bowels will at first, perhaps, be costive; but this may easily be remedied by occasional doses of the warmer and bitter purgatives, as aloes, colocynth, and rhubarb; which will operate as usefully by their tonic as by their aperient qualities.

The voracity produced by an exhausted state of the system, is rarely of difficult removal; for, in general, it requires good plain food, and abundance of it. It is most usually consequent upon rapid growth of the body in the period of youth, fevers, excessive discharges, especially from the bowels or bloodvessels, diabetes, long fasting, severe and uninterrupted exercise; and particularly the union of the last two, as often occurs in shipwreck, or the retreat from an enemy. It happens not unfrequently that, in such cases, the stomach occasionally overloads itself, and throws back some part of what has been swallowed. But this is of little importance, and often proves serviceable, by more effectually inculcating moderation, than can be accomplished by medical precepts.

SPECIES II.
LIMOSIS EXPERS.
LONG FASTING.

LOSS OR WANT OF APPETITE, WITHOUT ANY OTHER APPARENT AFFECTION OF THE STOMACH.

The causes that lay a foundation for this species are numerous, and some of them are accompanied with a slight diversity of symptoms. The following are the chief varieties it offers to us:—

α Defessorum. Want of appetite from exhaustion.	From too great fatigue or protracted fasting.
β Pathematica. Want of appetite from mental emotion.	From violent passion or other absorption of the mind.
γ Protracta. Chronic fasting.	From habit, or other cause, enabling the system to sustain almost total abstinence for a long and indefinite time without faintness.

Muscular exertion and long fasting, in a vigorous constitution, prove often, as I have just observed, the most powerful incentives to hunger. But, even in the most robust frame, if these are carried beyond a certain limit, the appetite palls, and is recovered with great difficulty; while, in the feeble and delicate, a very little exercise, and a slight protraction of a meal beyond the accustomed hour, and especially where the attention is directed to it, and hangs upon the delay, is productive of the same effect. In all these cases, the stomach is best re-excited to its proper feeling by half a wine-glass of sherry or madeira, with a crust of bread or piece of biscuit; or, if there be very great languor, by a few drops of laudanum in a teaspoonful or two of aromatic spirit of ammonia; while the interval should be filled up by what is most likely to attract the attention; for one of the surest revellents, in uneasiness of the stomach, is a strong excitement of the mind.

I have just said, that a strong excitement of the mind is one of the surest remedies for general uneasiness of the stomach; and every day shows us how powerfully this acts in repressing or taking away the painful sensation of hunger. No man, perhaps, ever had an appetite for food under a full influence of the depressing passions, as fear or grief: he may eat from persuasion, or a sense of duty; but he eats without desire, or any craving sense of hunger. Hence those who are suddenly deprived of their senses by an overwhelming and unexpected evil, pass days and nights without food of any kind, exclaiming, perhaps, in the language of King Lear—

—— "When the mind's free,
The body's delicate: the tempest in my mind
Doth from my senses take all feeling else,
Save what beats there."

Even where the mind is simply but entirely abstracted, and lost in itself while pursuing an abstruse problem or proposition, or adjusting a long train of intricate accounts in a banking-house, the individual has no sensation of hunger; and if left alone, may perhaps persevere, without knowing how the time proceeds, till warned by the darkness of the evening. And hence, La Bruyère, if I mistake not, in one of his pictures of an absent man, describes him, without any deviation from nature, as totally mistaken upon the subject of his dinner. Being summoned by his servant to the dinner-table, he answers that he will come immediately, but still continues in the same place, and indulges in the same revery, for an hour; when, being summoned a second time, he shows himself angry at the interruption, and still more so at the servant's stoutly insisting upon it that he had not dined, and that the dishes were still upon the table untouched, while the master contended, on the contrary, that he had actually made his dinner, and that too in the dining-room.

In simple cases of this kind, medicine is not wanted; and in the severer, it is of no use: for it is not in the healing art, under such circumstances, to "minister to a mind diseased." This must be left to time, the palliatives of friendship, and a change of scene.

The modifications, however, thus far contemplated, may be regarded as mere paroxysms, or acute cases of fasting. The most singular variety of the species consists in what may be called the chronic form of affection, exhibited in those who are able to endure an unbroken abstinence from food, for a long and indefinite period of time, without faintness or inconvenience of any kind.

The medical journals and ephemerides of

different nations, and the transactions of learned societies, abound with examples of this last and most extraordinary modification; many of them extending to a term of time so apparently extravagant as almost to repulse belief, notwithstanding the respectability of the authorities appealed to. It is necessary, therefore, before any such histories are noticed, that I should lay down a few general principles, too well established to allow of controversy, which by their conjoint force may lead us more readily to an admission of such as are founded upon trust-worthy evidence.

1. As the stomach is capable of acquiring a habit of gluttony, or of craving too much, so it may acquire a habit of fasting, or of craving too little: or, in other words, we are as capable of triumphing over the appetite of hunger, as we are over any other appetite whatever.

The desire for food, or the sense of hunger, is very painful for the first two or three days, after which it ceases, and does not return unless stimulated by fresh food. The Chippewas, or native savages of Canada, according to Mr. Long, give striking proofs of the power of the stomach in both extremes—that of hard eating, and that of hard fasting—and, as nearly as may be, at the same time: for, when one of these is on the point of commencing a journey, he devours as much as he would otherwise take in a whole week; the daily allowance of animal food alone being, on such occasions, as Captain Franklin tells us (*Journey to the Shores of the Polar Sea*, p. 250. Lond. 4to. 1823), eight pounds; and, having gorged the stomach, he starts upon his expedition, and commences a long season of severe abstinence.

2. Most of the cases of long fasting that are credibly recorded, have been introduced by a habit of this kind. A few, indeed, have been brought on suddenly; as the result of an accidental shock, inducing an instantaneous and unconquerable antipathy to food: but by far the greater number are of the former kind; and have had their origin in severe abstraction of the mind, by intense study, rigid mortification of the natural feelings in a course of religious discipline, or some growing obstruction, or other affection, in the passage from the mouth to the stomach, or in the stomach itself, producing great uneasiness in deglutition or digestion.

3. When a habit of this kind is once established, and a life of indolence or perfect quiet is associated with it, the quantity of food capable of supporting the animal frame may be reduced to a trifle, and may perhaps consist of water alone for weeks, or even months. We see examples of this in other animals than man. It forms a well-established fact in the history of fishes of various kinds. Even the pike, the most voracious, perhaps, of all fishes, when he has no longer an opportunity of indulging his gluttonous propensity, will both live and thrive upon water alone in a marble basin. The mere air of the atmosphere appears to afford nourishment enough for many forms of animal life. Snails and chameleons have been often known to live upon nothing else for years. Garman asserts it to be a sufficient food for the greedy spider; and tells us that, though the spider will ravenously devour flies and other prey, whenever he can seize it, he will not starve upon the spare regimen of air alone. Latreille confirms this assertion by an experiment of his own. He stuck a spider to a piece of cork, and cut him off from all food whatever for four months; at the end of which period he appeared to be as lively as at first. Mr. Baker in like manner confined a beetle under a glass for not less than three years; allowing him nothing but air for his diet: at the expiration of this period he was not only alive, but fortunate enough to effect his escape, and go in pursuit of a more substantial repast. And we are hence prepared to receive with less hesitation than we should otherwise do, the wonderful tales of frogs, toads, lizards, and other reptiles, found imbedded in trunks of trees, or blocks of marble, so deeply seated, that, though exhibiting life and activity on exposure to the atmosphere, they must have been blocked up in their respective cavities for fifty, and in some instances for a hundred years; cut off from every kind of food except the moisture by which perhaps they have been surrounded, and from all direct communication with the atmosphere itself; though, from experiments lately made by Dr. Edwards, it is absolutely necessary that there be an indirect communication of air through the pores or some other opening of the surrounding substance. Fishes, when rendered torpid by being suddenly frozen, are well known to live in this manner through the winter in the Polar Seas, and to be re-quickened into activity by the returning warmth of the summer. "The fish," says Captain Franklin (*Op. Cit.*, p. 248), describing the winter he passed at Fort Chipeywan, on the skirts of the Polar Sea, "froze as they were taken out of their nets, and in a short time became a solid mass of ice; and by a blow or two of the hatchet were easily split open, when the intestines might be removed in one lump. If, in this completely frozen state, they were thawed before the fire, they recovered their animation. This was particularly the case with the carp. We have seen a carp recover so far as to leap about with much vigour, after it had been frozen for thirty-six hours."

4. It may possibly be observed, that these examples are drawn, for the most part, from cold-blooded or exsanguineous animals, and that, in such cases, there is no waste of living matter by the skin, the great vehicle of discharge in animals of a higher rank. But they are drawn from animals that, in their common customs and habits, have the same instinctive craving for food, and the same faculty of converting it into their own substance, by the process of digestion, as animals of any superior class; while a like power of enduring long periods of fasting in a state of inactivity, without any injury to the general health, is quite as conspicuous and incontrovertible in many kinds of warm-blooded animals, and especially those that sleep through the winter season.

[A combination of circumstances is generally

essential to the occurrence, such as a diminution of sensibility and animal heat, a suspension of many of the functions, and especially a stoppage of the secretions and excretions. In this condition, individuals have been known to remain several weeks, and even whole months, without taking any food. Such cases are rare in the human race; but certain animals present us with annual examples of them. At the approach of winter, when they are large and fat, they fall into a torpid state, and continue so until the warmth of the spring returns. During all this time they take no food, their respiration is surprisingly slow; the blood has rather a gentle undulation than a circulation; and the trivial losses which take place are repaired entirely by the gradual absorption of fat. Hence, at the end of the torpid season, the emaciation of animals subject to its influence is very considerable. The emaciation which an accidental or a forced abstinence of long duration brings on man, and the generality of quadrupeds, is also notorious. A hog, weighing about 160 lbs., was buried in its sty for one hundred and sixty days, under a great mass of the chalk of Dover Cliff. When dug out, it weighed only 40 lbs. No food nor water happened to be in the sty when the portion of the cliff fell. The animal had nibbled the wood of the sty, and eaten some loose chalk, which, from the appearance of the excrement, had passed more than once through the body.]—(*Linnæan Trans.*, vol. ii.)

5. We have reason, therefore, as well from analogy as from recorded facts, to believe it possible for man himself, under certain circumstances, not indeed to pass life altogether without food, but to lose all relish for it, and to habituate himself to fastings of very considerable length, and only interrupted by slender portions of the sparest and dilutest aliment. [That hunger is a nervous sensation of the stomach seems probable, from its being influenced, like all the phenomena dependant on nervous action, by habit and by mental causes; from its being increased and excited by causes which act on the sensibility of the organ, as by spirituous drinks and spices, even when the stomach is filled; and by its being diminished by means of the contrary kind, as we know that opium will act in deadening the acute feelings of hunger, and that the Turkish and Indian fanatics, called Mollahs and Faquirs, are enabled by this means to support fasts of astonishing duration. The term to which life may be prolonged without aliment, is uncertain. As Dr. Percival has observed, it varies with the incidental circumstances of the case, and the constitutional powers of the individual. It is remarkable, however, that deprivation of food is better borne in some species of disease than in robust health. In certain hysterical cases, and scirrhous affections of the cardia and œsophagus, a degree of abstinence has been endured for many months, which, in other circumstances, could hardly have been sustained for as many weeks. In catalepsy and mania, a very rigid abstinence may be borne for a considerable period.]—(See *Dublin Hospital Reports*, vol. i., p. 159.) The cases are innumerable in which fasting has been endured ten, twelve, or fifteen days;* and, where there has been access to water, twenty or thirty days.—(*Phil. Trans.*, vol. xiv., p. 577; *Mémoires de Toulouse, l'an* 1788.) Raulin mentions one of fifty-two days, water alone being drunk during the time (*Observations de Médicine*, p. 270); and Dr. Willan attended a patient who had fasted sixty-one days, with the exception of drinking from half a pint to a pint of water daily, mixed with a very small quantity of orange-juice, two oranges lasting him for a week, without any employment of the pulp.—(*Medical Communications*, vol. ii.) But there are other cases related at full length, and upon authority altogether unimpeachable, of fasting continued for twenty-five months (*Bresl. Samml.*, band ii., passim); three (*Phil. Trans.*, 1742, 1777), ten, fifteen, and eighteen years; and, with a very spare and only occasional taste of solid food, through the entire life. In the running commentary to the volume on nosology, I have given several of these histories at some length, and the reader may amuse himself with them at his leisure.†

In most cases, and probably in all, if they had been critically investigated, water, tea, or some other fluid, seems to have been indispensably necessary; and such was found to be the fact in the noted instance of Ann Moore of Tetbury, that has occurred within our own day. That she was an impostor, in pretending to live without any food whatever, is unquestionable; but so very spare was the quantity she had accustomed herself to, from very great difficulty and pain in deglutition, that there is reason for believing that, for many years before she submitted to the test proposed, she had swallowed very little food of any kind, except tea and spring-water. And such is, in truth, the recorded opinion of the active and very intelligent committee, which undertook the trouble of

* Professor M'Naughton has recorded (Trans. of the Albany Inst., vol. i.) the case of a man, who lived fifty-three days upon water. In the New-York Med. and Surg. Journal, vol. ii., p. 21, Dr. Francis mentions a black woman, afflicted with the disease of obi, who for seven weeks refused food, and took during this time only two cups of wine and water.—D.

† See also Mém. de l'Acad. des Sciences, l'an 1764.—Stalpart Van der Wiel, Observ. Rar.—Mem. of the Lit. and Phil. Soc. of Manchester, vol. ii., p. 467, and two extraordinary cases of fasting, quoted in the Medical Gazette for July, 1833. In one of these instances, the patient is stated to have been living six years and a half without swallowing any food, though she moistened her mouth occasionally with water, tea, or whey, which she invariably spat out again. During four years, she had relief only once by stool, and three times by urine. At the age of thirty-five, the catamenia ceased altogether. In the other case, originally published by Professor Ricci, of Turin, the inability to take food continued about three years; and on the death of the patient, who was also a female, the descending colon, and commencement of the rectum, were found so obstructed by the effects of chronic inflammation, that no solid matters could pass along them.—Ed.

watching her night and day for a whole month, in rotation. Absolutely cut off from all fluids as well as solids, this woman was on the point of expiring when she reached the tenth day, and had scarcely strength enough left to confess the fraud she had been induced to practise. Yet the committee thus close their report of her history :—" On the whole, though this woman is a base impostor with respect to her pretence of *total* abstinence from all food whatever, liquid or solid; yet she can, perhaps, endure the privation of solid food longer than any other person. It is thought by those best acquainted with her, that she existed on a mere trifle, and that from hence came the temptation to say that she did not take any thing. If, therefore, any of her friends could have conveyed a bottle of water to her, unseen by the watch, and she could have occasionally drunk out of it, little doubt is entertained that she would have gone through the month's trial with credit. The daughter says that her mother's principal food is tea, and there is reason to believe this to be true."

It is remarked by Hippocrates, that most of those who strictly abstain from food for seven days, die within that period; and that if they do not, and even begin to eat and drink again, still they perish.

Where persons from famine, superstition, severe grief, or any other cause, have persevered in a course of rigid fasting for many days, and the frame is become frightfully emaciated and weakened, the greatest care is necessary in the administration of food; which at first should be light, liquid, and small in quantity; for, not only the stomach, but the organs of assimilation, lose all power by degrees; and if once requickened, are very apt to be unduly excited, and induce delirium and fever. It was in this way Dr. Willan lost his patient on the fifteenth day after his return to food, though the regimen adopted was peculiarly promising and judicious.

SPECIES III.

LIMOSIS PICA.

DEPRAVED APPETITE.

APPETITE FOR IMPROPER AND INDIGESTIBLE SUBSTANCES.

In this species there is no want of appetite; often, indeed, an inordinate craving; but, instead of its directing the patient, as in the first species, to palatable and substantial food, whenever such can be obtained, it urges him in preference to the most whimsical and innutritive materials. This character forms the specific definition. The specific name here given is PICA. Not that the term has any particular or very obvious merit; for its origin and primary meaning are doubtful; but that, out of many terms with which nosology has been encumbered to express this disease, pica appears to be the most general, and there is no sufficient reason for changing it.

Now, an appetite for improper and indigestible substances may be of two descriptions. It may proceed from a want of taste or discrimination, as in infants or idiots; or from a corrupt taste, or corrupt indulgence, often founded on empirical or other dangerous advice, as the eating of chalk or acids to produce a fair skin; and we have hence the two following varieties :

α Insulsa. Unwitting pica.	From want of correct taste or discrimination.
β Perversa. Perverse pica.	From a corrupt taste or indulgence.

The depraved appetite which is sometimes manifest in infants, can only proceed from want of proper management and direction; for nothing is more tractable than the organ of taste in early life. And hence, indeed, it is, that the different nations of the world are brought by habit, and habit almost coeval with their birth, to prefer such kinds of food as their respective climates produce in greatest abundance, or as they obtain by an easy barter of indigenous substances. Thus, the Hindoos live entirely on fruits and grain; the Tonguses, on berries, the refuse lichen found undigested in the stomach of the raindeer, dried fishes, and beasts of prey; the Californians, on snakes, rats, lizards, rabbits, intermixed with the wild herbs of the soil. But, perhaps, there is no stronger proof of the force of habit in forming an acquired taste to be met with in any part of the world, than in our own country; in our exchanging the natural and instinctive desire of a bland and sweet fluid, as milk, for the bitter beverage of tea for breakfast, and beer for dinner.

On this account it is not to be wondered at, that children, without a guidance, or with an improper one, should often acquire depraved or vicious tastes, and be longing for substances that are innutritive, or even hurtful to the general health. Where this propensity has obtained a footing, it may be successfully opposed by discipline, and overpowered by a counter-habit. Among idiots it is incorrigible.

A longing for improper and indigestible substances, however, is often produced by other means, and occurs in persons who are possessed of a sound judgment. It is frequently to be traced as a symptom of some other affection, as pregnancy, hysteria, chlorosis, and perhaps some species of mental emotion: in all which cases, it is only to be cured by curing the primary disorder.* But it sometimes exists as a primary malady, and is then most commonly brought on by a vain desire of improving the beauty of the person, of giving a graceful slenderness to the form, or a languishing fairness to the skin, through the medium of chalk, acids, or other empirical materials. In consequence of which the Greek physicians, in whose day the practice seems to have been more common

* Andral conceives, that pica may be one of the phenomena attending chronic irritation of the stomach; but, that in general, the cause of it would be ineffectually looked for in the condition of that viscus alone; the disease being observed to take place principally in certain morbid states, in which the blood and nervous system are primarily affected.—Anat. Pathol., t. ii., p. 194.—ED.

than even in our own, and this, too, among young men as well as young women, gave to this variety of the disease the name of *μαλακία, softness*, or *effeminacy*.

Whatever the cause, when this morbid propensity has once obtained a triumph over the natural taste, the substances for which it excites a desire are often not only of the most indigestible, but disgusting quality. We have had examples of an inclination for devouring dirt, cinders, ordure, fire, spiders, lice, toads, serpents, leeches, bits of wood, hair, candles, and more literature, in the form of paper and printed books, than is devoured by the first scholars in Christendom.

Borelli gives us numerous examples of most of these; and some of them of a very extravagant kind:* and those who are desirous of gratifying themselves still further, may have full indulgence by consulting the Ephemerides of Natural Curiosities Mr. John Hunter describes a longing for dirt, in the form of clay or loam, to have been an endemic disease among the blacks in Jamaica.† But he is surpassed by Dr. Darwin, who tells us that he once saw a young lady, about ten years of age, that had filled her stomach with earth out of a flower-pot, and then vomited it up, with small stones, bits of wood, and wings of insects among it.‡

There are other persons who have had a taste for harder substances, and have glutted themselves with stones,◊ glass,‖ and even leaden bullets.¶ Others, again, have feasted on pieces of money, which have sometimes formed a very expensive repast; for Borelli gives us an instance of a pantophagist who swallowed a hundred louis-d'ors at a meal.** Yet, perhaps, after all, the most marvellous, though certainly one of the most common exhibitions of depraved taste, is an appetite for knives. There is not a country in Europe but has furnished examples of this in both sexes: and hence the medical journals and miscellanies are numerous in their descriptions of London knife-eaters;†† Prussian knife-eaters;‡‡ Bohemian knife-eaters;◊◊ and even, out of Europe, Brazilian knife-eaters.‖‖ The wretched patients have sometimes perished shortly after the extraordinary feat; and sometimes dragged on a miserable existence for a few years, before they fell victims to their madness or malady. In a few instances, they have recovered.

In an extraordinary instance of this kind, that not long since occurred in our own country, the knife-fancier, Cummings by name, and by craft a sailor, lived ten years after his first experiment, and occasionally persevered in the same trick during the whole of this time. The rash act is sometimes overcome, and the materials discharged piecemeal; and it might have been so in this man, but for the foolhardiness that made him insensible to the earlier warnings given him, and urged him to a repetition of the offence.* Even the American States seem of late to have furnished us with a similar example, in a young man who had long, we are told, been in the habit of swallowing various indigestible substances, as buttons, musket-bullets, and billiard-balls; and being thus initiated in the art, on June 22, 1822, swallowed not less than fourteen knives within the course of the day. Repentance came too late. He sunk gradually beneath his exploit, and died on the ensuing 25th of August. Two of the knives had been discharged from the body, one was found in the œsophagus, and the rest in the stomach. The same individual is said, on one occasion, to have swallowed a gold watch, with its chain and seal, and to have evacuated them on the ninth day, darkened in colour, but not otherwise injured.†

If this variety should happen to be united, as it sometimes is, with *pica avens*, or voracity,‡ there may be no bounds to the deglutition, either in quantity or quality.◊ M. Fournier, in his *Cases Rares*, has given us an instance of this kind, so extraordinary, that if it had not been most unexceptionably attested, it would not have been credible. A galley-slave, he tells us, of this description, and who was disordered in his intellects, fell at length a sacrifice to a colic, accompanied with a cough; and,

* Cent. i., obs. 24, 52; ii., 37; iv., 25.
† Obs. on the Diseases of the Army in Jamaica.
‡ Zoonom., cl. III., i. 2, 19.
◊ Act. Hafn., vol. v.
‖ Camerarius, Memorab., cent. v.
¶ Bonet, Medic. Septentrion., lib. i., p. 510. Binninger, obs. cent. ii.
** Cent. iv., obs. 95.
†† Act. Hafn., v. 107.
‡‡ Dolæus, Encycl. Chir., p. 679.
◊◊ Crollius, Basilic. Chym., præf., p. 119.
‖‖ Binninger, cent. v., obs. 7.

* Marcet, Trans. of the Medical and Chir. Society, vol. xii., p. 52.
† New-York Medical Repository, Oct., 1822.
‡ In the *Trans. of the Roy. Asiatic Soc.* for 1833, General Hardwicke has given some details in regard to the East Indian cannibal, or *sheep-eater*, whose disgusting exhibitions have been attested to by numbers. The general, who was an eye-witness, there states, that the sheep-eater had with him two living sheep: after a brief harangue to the multitude around him, he seized the fleece of one sheep with his teeth, and, by swinging his head, flung it on the ground. In this position he tore the animal open, by stripping off the skin from the flank to the breast: he then took out the intestines, thrust his head into the peritoneal cavity, and drank the blood. The rest of the hide was then removed, the ribs separated, the limbs disjointed: each part was rubbed with dust, to dry up the blood, as he said, and to enable him to tear the meat from the bones with greater ease. He then swallowed one mouthful after another with the dust adhering, and the performance was concluded by his collecting some leaves of the madder plant (*asclepias gigantea*) and chewing them; the milky juice of which, he said, would assist digestion. This monster, who was squalid and emaciated, generally ate two sheep at a meal.—D.
◊ In the Medical Gazette for 1832-33, p. 574, the case of a woman is quoted, who used to devour raw lights, and large quantities of grass. In July, 1828, she ate so copiously of grass and buttercups for her supper, that she was seized in the night with severe pains in the abdomen; jaundice ensued, and she died in a few days.—Ed.

on opening him, the stomach was found to occupy the left hypochondrium, the lumbar and iliac regions of the same side, and to stretch down into the pelvis. It was of a long, square form, and contained the following substances: a piece of stave *nineteen inches long*, and half an inch in diameter; a piece of a broomstick, six inches long, and half an inch in diameter; another piece of the same, eight inches long; ditto, six inches long; twenty-two other pieces of wood, of three, four, and five inches in length; a wooden spoon, five inches long; the pipe of an iron funnel, three inches long, and one in diameter; another piece of funnel, two inches and a half long; a pewter spoon entire, seven inches long; another, three inches long; another, two inches and a half long; a square piece of iron, weighing nearly two ounces; various other articles, among which were nails, buckles, horns, knives, &c.; the whole weighing about twenty-four ounces avoirdupois.—(*Dict. des Sc. Méd.*, art. CAS RARES.) So that the stomach of this unhappy being became gradually enlarged into a warehouse for all sorts of marine stores, as the term is applied in the present day.

This morbid action is best opposed by giving a counter-action to the organ in which it exists. And hence emetics and purgatives are highly useful. Rhubarb is perhaps the best medicine for the latter purpose; and in moderate doses it should be continued daily; and in combination with it, bark, steel, and other tonics. An acid has often been suspected as the cause of the disease, and the absorbent earths, as chalk, magnesia, and Armenian bole, have been tried in large quantities; but the relief they afford is seldom more than temporary. In the mal d'estomac, or cachexia *Africana*, as it has been called, which is the disease of dirt-eating among the negroes referred to by Mr. J. Hunter, perhaps great acidity may exist, and instinctively call for the drier earths, as absorbents.

SPECIES IV.

LIMOSIS CARDIALGIA.

CARDIALGY.

IMPAIRED APPETITE, WITH A GNAWING OR BURNING PAIN IN THE STOMACH OR EPIGASTRIUM, AND A TENDENCY TO FAINT.

THE symptoms laid down in this definition, are sufficiently marked to separate cardialgy from dyspepsy, in which it is merged by Dr. Cullen and various other writers; for, in the last, there is not necessarily a gnawing or burning pain; and the appetite is rather fastidious, than essentially, or at all times impaired. Cardialgy is certainly sometimes found as a symptom in dyspepsy, as it is also in a multitude of other complaints; as flatulency, scirrhus or inflammation of the stomach, worms, retrocedent gout, suppressed menstruation, and various diseases of the heart, liver, pancreas, kidneys, and intestines; in hypochondrias, and in sudden and violent emotions of the mind; but it is likewise found, in many instances, as an idiopathic affection, and should therefore be described as such.

Cardialgy admits of the three following varieties:

α Mordens. Heart-burn.	Gnawing or burning uneasiness, felt chiefly at the cardia, the tendency to faint being slight.
β Syncoptica. Sinking heart-burn.	The pain or uneasiness extending to the pit of the stomach; with anxiety, nausea, coldness of the extremities, failure of strength, and great tendency to faint.
γ Sputatoria. Black-water. Water-brash.	Burning pain extending over the epigastrium; and accompanied with an eructation of watery fluid, usually insipid, sometimes acrid.

The first variety is perhaps the most common form of the disease. And as the gnawing or burning pain is in this case felt chiefly at the cardia, or upper orifice of the stomach, the specific name of cardialgy is derived from this symptom. The cardia is indeed generally supposed to be the immediate seat of affection: but this is an erroneous view. It is from the greater sensibility of the upper orifice of the stomach than any other part of it, that we are most sensible of uneasiness in that region: but irritability of the whole, or of any other part of the organ, and perhaps of the adjoining organs, as the pancreas, spleen, and liver, will often produce the same local pain; and, in some instances, it has been ascertained after death to have been occasioned by a schirrous, or some other, obstruction of the pylorus.

In the second variety, we find the pain or uneasiness somewhat less intense, but far more general; reaching, indeed, over the whole range of the stomach and epigastrium, accompanied with nausea and anxiety; and, by sympathetically affecting the general system, attended with coldness of the extremities, failure of strength, shortness of breath, and great tendency to faint, which continues till the system reacquires warmth and perspiration.

From the wider circumference of the affection, Hippocrates denominated it periodynia stomachi. It is distinguished in popular language by the name of *sinking heart-burn*.

The third variety is distinguished by a morbid increase in the quantity of the fluids secerned; and hence the peculiar symptom of an eructation, frequently in considerable abundance, of a thin, watery liquor; chiefly in the morning, after food has been abstained from for many hours, and the stomach has nothing in its cavity but its own fluids. Dr. Cullen has admirably described the disease; though he has singularly separated it to a great distance from dyspeptic affections, transferred it to another order, and erected it, apparently contrary to his own mode of reasoning, into a distinct genus. "It appears most commonly," says he (*First Lines*,

vol. iv., p. 13), "in persons under middle age, but seldom in any persons before the age of puberty. When it has once taken place, it is ready to recur occasionally for a long time after; but it seldom appears in persons considerably advanced in life. It affects both sexes, but more frequently the female. The fits of this disease usually come on in the morning and forenoon, when the stomach is empty. The first symptom is a pain at the pit of the stomach, with a sense of constriction, as if the stomach were drawn towards the back; the pain is increased by raising the body into an erect posture, and therefore the body is bended forward. This pain is often severe; and, after continuing for some time, brings on an eructation of a thin watery fluid in considerable quantity. This fluid has sometimes an acid taste, but is very often absolutely insipid. The eructation is for some time frequently repeated; and does not immediately give relief to the pain which preceded it, but does so at length, and puts an end to the fit." To this description it may be added, that, when the watery discharge is altogether insipid, there is merely an increased secretion of the fluids poured into the stomach, apparently in a thinner or more dilute condition; and that, when this discharge is of an acrid taste, the gastric or other juices, which exist simply and without food or other intermixture in the stomach at the time, possess an acidity in themselves; a fact, which closely connects pyrosis with cardialgy as a species, and readily reduces it to the rank of a variety under its banner. In the colloquial tongue of England, it is called *black-water*; in that of Scotland, *water-brash*, and *water-qualm*. It is the pyrosis of Sauvages, and many other writers.

Most of these varieties have sometimes returned periodically,* especially in the spring; and as their general causes and mode of treatment do not essentially differ, it is more convenient to consider them jointly than under detached heads. Dr. Perceval, of Dublin, in the manuscript comment with which he has obliged me on the nosology, ingeniously inquires, "Does it ever arise from an affection of the pancreas?" I think it likely that it does, from contemplating the structure and office of this organ; and we have various cases in which, after death, the pancreas has been found considerably enlarged.†

The remote causes then of the present species, under whatever variety it shows itself, which is chiefly regulated by the habit or idiosyncrasy of the individual, are indigestible food or other ingesta; and habitual and copious use of very cold or very hot beverages, but especially the latter; indulgence in spirituous potations; worms, hydatids, and insects or their larvæ; drastic purges; obstructed perspiration; repelled cutaneous eruptions; and bile depraved, or excessive in its secretion. Of the indigestible foods, the most common are animal fat, oil, butter, or cheese, eaten in excess; which last has produced a cardialgy that continued for three years.* The stones or kernels of fruits have often laid a foundation for the complaint, especially where they have remained, as they have occasionally been found to do, and particularly cherry-stones, for two, or even for three years, with little or no change whatever.† It occurs also, as already observed, not unfrequently as a sequel or symptom of some other affections.

All these causes have a direct tendency, to produce imbecility of the stomach, especially a loss of tone, or weaker action in its muscular fibres; and a morbid condition of the fluids secreted by, or poured into it.

Acidity seems to be common to all its varieties; and this to such a degree that, as Dr. Darwin observes, the contents of the stomach, when regurgitated on a marble hearth, have often been seen to produce an effervescence on it.

The acid, according to the experiments of M. Perperes, is chiefly the acetous, and he has found, that not less than two ounces and six drachms of it have been produced by eight ounces of roasted chestnuts, an aliment that ferments in the stomach for an hour and a half; and is even then digested with great difficulty. In some cases, the formation of acetous acid seems to be favoured by the nature of the gastric fluid itself, which appears to be secreted in too dilute or weakly a condition for the purposes of digestion; on which account, the food, instead of being converted into chyme, runs readily into a state of fermentation, so that some persons cannot take either honey or sugar without producing this effect; while in others, the gastric juice itself, when first secreted, may possibly contain too large a proportion of the muriatic acid, which, according to the late valuable researches of Dr. Prout, is found in the stomach during digestion.

It is not improbable that the third variety, *cardialgia sputatoria*, may, in some instances, be produced by inactivity of the proper absorbents of the stomach. The experiments of M. Magendie show that, in a state of health, all fluids disappear from the stomach with great rapidity, in consequence of the urgency of their absorption, insomuch that a ligature on the pylorus does not in the least retard their vanishing.

* Bartholin. Hist. Anat., Cent. iii., Hist. 50. Zacchius, Consil. N. 54, 98.

† Post mortem examinations demonstrate that this is occasionally the cause of pyrosis. An enlargement and schirrus of the pancreas have been found, says Dr. Francis, in cases where the patient has long suffered from this infirmity: he adds, that the disordered condition of this organ is also attended with great irritability of the stomach, the contents of which are ejected with great violence. These views are partially sustained by Dr. Sewall, of Boston, in his paper on the diseases of the pancreas.—(See New-Eng. Journ. of Med. and Surg., vol. ii.) The excessive drivelling of some inebriates who have indulged in the abuse of spirituous drinks, adds Dr. F., is in part at least to be explained by the altered condition of the pancreas, as demonstrated by autopsic examination.—D.

* Paulini, de Nuce Moschata, sect. iii., p. 2. Eph. Nat. Cur., Dec. II., Ann. v., app. 71.

† Bresl. Samml., 1725, i., p. 77. Gronen. Commerc. Liter., Nov., 1733, p. 189.

pplying to this disease the resources of
t of healing, it is obvious that our inten-
ould be twofold: to palliate the present
s, and to prevent a recurrence of the
sms. The first may be obtained by small
of opium, and sometimes by other anti-
odics, as the ethers and ammonia; and
acidity is unquestionable, by calcareous
ponaceous earths.* Lime-water, or acid-
ılkaline waters, or the carbonates of soda
otash, magnesia and lime, have been
the only ones that have hitherto been em-
, or at least the others have not been sub-
to a sufficient trial, and under a sufficient
of modifications, to enable us to speak
n with accuracy. It is a common belief
ıalk, with an acid in the stomach, pro-
an astringent, and magnesia a laxative
. This idea is doubted by Dr. Cullen;
but it seems to have a foundation, and should regulate our practice. Chalk, however, when used in large quantities, and long persevered in, has an indisputable evil, which does not equally belong to soda or magnesia; and that is, its aptitude to form balls or calculi in some part of the intestinal canal; and thus produce a very troublesome obstruction, and occasionally colic: I have known various instances of this; and, in some cases, attended with alarming symptoms before the balls were dejected; many of which I have also known to be evacuated in masses of more than an ounce weight each. There is no evidence that an acid is found below the duodenum, and hence it is chiefly in the upper part of the alimentary canal, that these calculous concretions are impacted and agglutinated. Dr. Parr and some others assert, that an acid formed in the stomach certainly never enters the circulating fluid. It is indeed true, that we have no sensible trace of it in the course of the circulation: but the benefit which has lately been discovered, and which we shall have occasion to advert to more fully hereafter, of introducing magnesia into the stomach, in habits possessing a tendency to form calculi in the kidneys and bladder from a superabundant secretion of lithic acid, seems to show, that an acid principle, or base, still passes from the stomach into the circulation in certain cases, though too minutely divided to be detected by chymical tests; and that the introduction of magnesia into the stomach destroys or neutralizes it at the fountainhead.—(See Enterolithus and Lithia.) M. Perperes, in taking off acidity from the stomach, unites the calcareous earths with a warm bitter; and recommends, as the medicine he has found most successful, columbo root with magnesia, in doses of ten grains of the former to twelve of the latter.

It is observed by Dr. Darwin that, as the saliva swallowed along with our food prevents its fermentation, considerable relief is sometimes derived from frequently chewing parched wheat, mastic, or a lock of wool, and swallowing the saliva thus procured.

Oleaginous preparations have also been employed, and in some habits apparently with success. In such cases, it is most probable that they act, first, by converting a part of the acid into soap; and next, by proving aperient, and thus accelerating the passage of the acid material into the intestinal canal. The complaint may also be palliated by mucilaginous substances, such as Spanish liquorice, or gum-arabic. In many cases, speedy and effectual relief is obtained by the simple and pleasant remedy of eating six or eight almonds.

Yet, where we have full proof of acidity as the exciting cause, there are few medicines we can more fully depend upon than soap; probably because in its decomposition it lets loose the oleaginous principle, which may in some degree obtund the pain, and at the same time unites its alkali with the acid of the stomach; thus neutralizing its acrimony, and forming a valuable aperient. "It is often," says Dr. Cullen (*Mat. Med.*, vol. ii., p. 400), "a more convenient

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strodynia and *gastralgia* are terms frequently
lmost synonymously with cardialgy. In
n of gastrodynia, described by Dr. Barlow,
ı, the disease is represented as depending
redundant and unhealthy state of the
ı secretions of the stomach and bowels.
instead of endeavouring, in the first in-
to palliate the pain with opium or stimu-
ıe begins with active purgatives of calomel
ocynth, with or without the addition of tar-
antimony. When the costiveness is ob-
and habitual, he exhibits every night, or
ight and morning, if necessary, colocynth,
pill, or colocynth conjoined with henbane,
ts of the former to one of the latter. While
t medicines are continued, some of the
salina cardiaca of the Bath Hospital Phar-
eia is given, composed as follows:—

℞. Sodæ Subcarb. ʒiss
Aq. Puræ Oviiss.
Acid. Sulph. dil. ʒj.
Confect. Aromat. ʒiij.
Spir. Menth. Pip. ʒiij.

foregoing quantities, thus combined, yield
. of sulphate of soda, 423 grs. of the sub-
ıte remaining unaffected by the acid. Thus
ınce of the mixture contains but a few grs.
ır salt; yet, insignificant as the dose may
it is not inert. When gastrodynia still goes
ır the secretions of the alimentary canal
ıen rectified, Dr. Barlow has found the ox-
bismuth the best auxiliary medicine, in the
five grains, with one of aloes, given three
day, in conjunction with the cordial mix-
For some cases, spirit of ammonia is a
ıddition; while for particular examples the
re and cordial mixtures in equal parts; and
ırs, a blister to the scrobiculus cordis, are
ıoken of."—(See Cyclopædia of Practical
ıe, art. Gastrodynia.) With these observa-
lelivered by Dr. Barlow, the practitioner
efully compare those made by Jolly, in his
t of *Gastralgie*, Dict. de Méd., &c., Paris,
In gastrodynia, not apparently occasioned
thing in the stomach, "you find tinct. of
an excellent remedy. In the continued
f the disease, prussic acid will answer
but I never saw it succeed, when it was
for immediate effect."—(Elliotson's Lec-
In full habits, he advises bleeding, which
often seen relieve gastrodynia at once.
ıium he has also known cure gastrodynia,
not producing costiveness, is preferable to
—Ed.

remedy than common absorbents or simple alkalis." If the pain be very severe, we shall much improve the beneficial operation of the soap by combining it with opium. This I have already mentioned as a valuable medicine in all the varieties of the disease; but it is peculiarly so in water-brash, or the third variety. The distinguished writer I have just quoted asserts, indeed, that he has found nothing but opium that will give it real relief: but this, he afterward adds, relieves only the present fit, and contributes nothing to the prevention of future attacks.*

It is hence necessary, in every case, to direct our view to the second intention I have pointed out: I mean that of preventing a recurrence of the paroxysm.

Now, this can only be done effectually by restoring the stomach to its proper tone; and hence the entire process we shall have to notice under Dyspepsia, forming the seventh species of the present genus, will here be found equally advantageous. The warmer bitters, the metallic oxydes, and especially the oxydes of zinc and bismuth, first mentioned by Odier,† bid fairest for success. Of the bitters, one of the most elegant, as well as most effectual, is the extract of chamomile. The nux vomica, long since extolled by Linnéus, remains yet to be fairly experimented with in this country. It has the peculiar property of diminishing the sensibility, while it increases the irritability of the animal frame—a property of which I shall speak more at large when discussing the subject of Paralysis. It is said to have been given in doses of ten grains three times a day. But this I very much question, where the drug has been sound and genuine. In palsy I have never been able to raise it above seven grains, without making the head stupid and vertiginous.‡

Among the aromatics, many of the terebinthinate balsams will be found highly useful. The balsam of Gilead, and that of Mecca, *amyris Gileadensis*, and *a. Opobalsamum*, were once highly extolled, and perhaps deservedly; but are too dear for common use The Turks take eight or ten drops as a dose; but the quantity may be considerably increased. In some of the pharmacopœias, cubebs, as much cheaper, have been ordered instead of the balsams.

The diet should consist of articles least disposed to ferment; as animal food generally, shellfishes, biscuits; and the drink be, small brandy and water, toast and water, lime-water, or most of the mineral waters.

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* Among the means of affording prompt relief, ought to be mentioned hot fomentations to the epigastrium, and the use of the warm bath. Where tenderness on pressure is complained of, leeches are also frequently proper. If there be very fetid eructations, it is best to give an emetic; or, if this be not judged proper, the practitioner may try the effect of common acids, or two or three drachms of the solution of the chlorurets in ordinary use. Elliotson.—(See Med. Gazette, 1832-33, p. 659.)—Editor.

† Odier's practice of administering the oxyde (subnitrate) of bismuth, when first introduced, was quite popular, and Dr. Moore published a thesis on the subject; but this remedy is now fallen almost into disuse. The internal administration of charcoal, blended with a small proportion of pulverized myrrh, is recommended by many.—D.

‡ According to Professor A. T. Thomson, the nux vomica, in the form of powder, has been carried to the extent of fifty grains a day.—*Elements of Materia Medica*, vol. i., p. 356.

SPECIES V.

LIMOSIS FLATUS.

FLATULENCY.

IMPAIRED APPETITE, WITH AN ACCUMULATION OF WIND IN THE STOMACH OR INTESTINAL CANAL; AND FREQUENT REGURGITATION.

It is supposed by Mr. Hunter, that air is occasionally secreted from the mouths of the secernents into certain cavities in which it is found: but, in the present instance, there can be little or no doubt that it is merely separated from the materials introduced into the stomach in the form of food, and tending towards fermentation. When the fluids, which are poured naturally into the stomach, are secreted in a state of health, they concur, and perhaps equally so, in checking fermentation. But when, from imbecility of this organ, or its consociate viscera, they are secreted in a dilute or other imperfect state, they lose their corrective power, fermentation rapidly commences, and the stomach is overloaded, distended, and sometimes ready to burst with the air, for the most part carbonic acid gas, that is hereby let loose; relief being only obtained by frequent *eructation*, or rejection upwards; *crepitation*, or rejection downwards, which the Greeks denominated *βόμβος*, as the Latins did *crepitus*; or its combining loosely with such fluids as may exist in the large intestines, where it often rolls about in an ascending or descending direction, according to the action of the diaphragm and abdominal muscles; sometimes with a rumbling sound, where the intestinal fluid is but small in quantity, and sometimes, where it is considerable, with a gurgling noise, like air rushing into a bottle as the water contained in it is poured out; and hence by the Greeks denominated *borborygmus*. We have, in consequence, the three following varieties, under which this species presents itself to us:—

α Borborygmus. Rumbling of the bowels.	With frequent rumbling of the bowels.
β Eructatio. Eructation.	With frequent rejection upwards.
γ Crepitus. Dejection of wind.	With frequent rejection downwards.

The quantity of air separated in the manner just described is sometimes prodigious, and may amount to an eructation of many hogsheads in an hour. Nor need we be surprised at this; for, by the experiments of Dr. Hales, it appears that a single apple, during fermentation, will give up above six hundred times its bulk of air; while many of the vegetable materials introduced into the stomach possess far more ventosity than apples.

Flatulence, under one or other of the forms

now enumerated, is often found as a symptom of other diseases; especially in dyspepsy, cholera, colic, hysteria, and hypochondrias. But there is no doubt that it occasionally exists by itself, and is strictly idiopathic, occurring after the deglutition, and even enjoyment, of a full meal, without any other symptom of indigestion, and ceasing as soon as the process of digestion is completed.

[Flatulence produces various feelings of distress, according to the part of the alimentary canal in which the wind is generated, or pent up. When it is copiously generated in the stomach, and is not expelled by eructation, it gives rise to all the distressing consequences always resulting from great distention of that organ. In some instances, severe pain is excited by the simple extension of its fibres, or their spasmodic contractions. In others, especially in hysterical habits, the adjoining organs are considerably affected by the pressure of the distended stomach; whence great anxiety and oppression are felt in the chest from the impediment to the free motion of the lungs and heart; the respiration becomes laborious and difficult, with a sense of suffocation, and the action of the heart intermits, or violent palpitations occur.

When the bowels are inflated, a sense of uneasiness is experienced, with a rumbling or gurgling noise. Sometimes colic is an attendant on the complaint, and sometimes the whole abdomen is enlarged by the general distention of the intestines with air, accompanied with constipation. When this distention has been of some duration, a degree of paralysis of the muscular fibres of the bowels is produced; their power of expelling the wind is lost; the skin of the belly becomes as tight as the parchment of a drum; and the patient falls into a state of great emaciation. This disease is called *tympanites*.]

A very common cause of flatulence is drinking a large quantity of some cold fluid while the system is labouring under great heat. Another is eating raw vegetables, cucumbers, radishes, salads, &c., or cabbages and other vegetables not duly boiled.

Infants are peculiarly subject to this affection, from the natural delicacy of the stomach, and particularly when brought up without their natural sustenance, and upon food which requires more labour of the stomach to digest. In many cases it must necessarily be combined with acidity; for this, as already observed, is a general effect of impaired action in the chylific viscera; and when both these causes concur, the infant will also be tormented with severe gripings and great irregularity in the bowels; a distressing and watery diarrhœa; or an obstinate costiveness; and sometimes with both in succession. Essential oils, absorbent powders, and aperients, may palliate the symptoms, but the best cure will always be found in a healthy breast of milk.

Hypochondriacs, and others of weak digestive power, are very apt to acquire a habit of eructing; and are perpetually striving to throw up wind from the stomach in an expectation of relieving themselves from the elastic vapour with which they seem to be bursting. It was observed by Dr. Darwin, that when people voluntarily eject carbonic acid gas from their stomach, the fermentation of the aliment is accelerated; just in the same manner as stopping the vessels which contain new wines retards their fermentation, and opening them again quickens it. [This idea, applied to the case of flatulence, may be ingenious; but probably it will never persuade a single patient to repress his endeavours to relieve himself by eructations. The reality also of the ill effects of the practice is doubtful.] If cardialgy attend, the air is sometimes eructed with a sense of burning so violent as to make the patient imagine he is actually, like a volcano, belching forth flames and fire from his entrails.

There are some cases on record, in which persons appear to have a power of distending the stomach and abdomen to an enormous size at pleasure; and advantage has been taken of this by one or two female impostors, who, for particular purposes, have hereby pretended to be pregnant, and have succeeded by such an imposition. But a distention of this kind does not belong to the disease before us.

The cure in this species, as in the last, depends upon giving tone to the muscular fibres of the stomach and intestinal canal; and hence the plan laid down already, and the course to be described under dyspepsy, will have the greatest chance of success.

Emetics have occasionally been recommended with a view of giving a change to the action of the stomach; but they are of doubtful efficacy. They have been of great service, however, incidentally, by discharging some lurking body which has itself been a chief cause of the disease. In this manner, worms have at times been thrown up; and at times also morsels of indigested fruit or other materials, as plum-stones, or fragments of a pear or apple.—(*Riedlin, Lin. Med.*, ann. iv. v.)

The disease may be palliated by an innumerable host of carminative plants, which vary in their several effects according to the variety of the idiosyncrasy, or the actual state of the stomach. The verticillate order affords an abundant stock, from which we may select at pleasure; as marjoram, thyme, rosemary, lavender, spearmint, peppermint, and pennyroyal; the aroma of all which resides chiefly in the leaves or calices. The coniferous order offers, perhaps, nearly as many, including the terebinthinate and juniper tribes; but of less activity than the preceding, except in the instance of the essential oil of juniper, the pleasantest of all the turpentine family. The medicinal virtue of both these orders is that of camphire, which they all contain very largely, especially the peppermint, as shown by the experiments of Gaubius.—(*Adversar.*) The pungency of this plant, however, is so acrid as to exhaust the sensibility of the nerves of the tongue and palate for a moment, and hence to give a feeling of coldness in succession to that of heat. Its best form is

what is called its essence, which, as conjectured by Dr. Cullen, appears to be nothing more than its rectified essential oil dissolved in spirit of wine. On account of the acritude of this plant, it is less valuable, as well as less palatable, than spearmint; which last acts better, and is more pleasant to the taste, when fresh in infusion than when distilled.

The umbellate order affords also a rich variety of carminatives, whose virtue, with a few exceptions, resides almost entirely in their seeds. The aroma of several of these is very pleasant, as the coriander, anise, and dill; while, in a few, as in the fennel, it approaches the nauseous smell and taste of the fetid gums. This, however, is an advantage in flatulencies occurring in hysteric or other nervous habits.

To these may be added many of the aromata imported from hot climates in very different forms; as barks, roots, berries, pods, and seeds, particularly ginger, cloves, cardamoms, cinnamon, pimento, pepper, and capsicum. Like those already noticed, they all owe their virtue to an essential oil, in whatever part of the plant such virtue may reside: but several of them have likewise some other property, which may render them more or less eligible in different cases. Generally speaking, the stimulants we are now contemplating are more strictly entitled to the name of cordials than the umbellate or verticillate plants; for, by exciting the nervous energy in a greater degree, they increase the action of the heart, and quicken the pulse. And hence, when the circulation is weak and languid, they have an advantage over the preceding; but when the pulse is already too frequent, they should be abstained from.

To this general remark, however, there may be one or two exceptions. Newmann and Gaubius, reasoning from the general use of pepper among the Hindoos and Javanese without any particular marks of excitement, have contended that it produces less effect on the sanguiferous system than many other carminatives; but this may be resolved into habit. Dr. Lewis, from some less obvious train of argument, came to a like conclusion in respect to ginger; which to many is as heating as any of the spices whatever. But it seems generally conceded, that nutmeg is entitled to the character of a sedative and even of an hypnotic; and hence, where flatulence is accompanied with great irritability, it becomes peculiarly valuable. Bontius speaks of this influence as a matter of frequent occurrence in the East Indies, and one which had often fallen under his own observation; and in the German Ephemerides (Dec. ii., Ann. ii., Obs. 120) we have an account of some extraordinary effects on the nervous system, occasioned by swallowing a large quantity of this spice. To which I may add the following confirmatory evidence of Dr. Cullen, derived from his own practice. "A person by mistake," says he, "took two drachms or a little more, of powdered nutmeg. He felt it warm in his stomach, without any uneasiness; but in about an hour after he had taken it, he was seized with a drowsiness, which gradually increased to a complete stupor and insensibility; and not long after he was found fallen from his chair, lying on the floor of his chamber, in the state mentioned. Being laid abed, he fell asleep; but waking a little from time to time, he was quite delirious; and he thus continued alternately sleeping and delirious for several hours. By degrees, however, both these symptoms diminished; so that, in about six hours from the time of taking the nutmeg, he was pretty well recovered from both: although he still complained of headache and some drowsiness, he slept naturally and quietly through the following night, and next day was quite in his ordinary health."*

Many of the foregoing remedies have often been combined with the oxyde or nitrate of bismuth; and as they have commonly been more successful with such adjuncts than when given alone, these preparations of bismuth itself may be regarded as a useful carminative. They are especially serviceable when the flatulence is chronic, and accompanied with distressing pain.

Before quitting this subject, I will just notice two other remedies for flatulence, because they not only afford benefit at the time, but, by their tonic virtue, have some tendency to correct the disorder radically.

The first of these is the tincture of *aspalathus canariensis*, the rosewood, or Rhodium lignum of the old writers. This shrub readily yields its fragrant essential oil to rectified spirit; and the tincture is commonly made by macerating four ounces of the wood in a pint of the spirit. It proves a warm, balsamic, and pleasant cordial, in doses of from twenty or thirty drops to a drachm.

The second remedy I have alluded to is the etherial oil, as it is now called, or the oleum vini, as it was called formerly, which is found in the residuum of sulphuric ether, and is easily made to float on the surface by the addition of water. It has a strong, penetrant, and aromatic odour, and readily dissolves in alcohol and ether. It is powerfully sedative as well as cordial, and is sufficiently known to be the basis of Hoffman's celebrated anodyne liquor. In the Pharmacopœia of the London College, this anodyne is imitated in the compound spirit of ether, the only preparation in which the etherial oil is an ingredient. For the purpose I am now speaking of, however, it should be dissolved, and in double the quantity contained in the preceding preparation, in the aromatic spirit of ether. [Flatulence admits of being relieved by the generality of stimulant and antispasmodic medicines, such as assafœtida, the strong smelling gums, ammonia, opium, ether, &c. Together with internal remedies, Dr. Darwin applied fomentations to the epigastric region, and Dr. Whytt, stimulating liniments.]

* Hence, Dr. Cullen cautions us against giving this aromatic in apoplectic or paralytic cases. The use of the nutmeg, as a medicinal agent, dates from the time of Avicenna. "The volatile oil is sometimes ordered in the form of an oleo-saccharum in flatulent states of the stomach and intestines," &c.—See *Dr. A. T. Thomson's Elements of Materia Medica*, &c., vol. i., p. 226.

SPECIES VI.

LIMOSIS EMESIS.

SICKNESS OF THE STOMACH.

REJECTION OF THE CONTENTS OF THE STOMACH, OR TENDENCY TO REJECT.

A DISPOSITION to regurgitate, or even the act of regurgitation itself, is not necessarily a morbid affection; and to render it such, it must be combined with the symptoms forming the generic character, which, though not specifically repeated, are always supposed to constitute a primary part of the description; and which, in the present genus, is an "impaired, excessive, or depraved appetite." Thus a regurgitation of food is natural to all grazing quadrupeds possessing complicated or numerous stomachs, as the sheep and ox; and it constitutes what is called rumination, or chewing the cud; the inverted action taking place at the will of the animal, and the food being thrown back from the first stomach, or paunch, into the mouth, for the purpose of further mastication. There are instances of rumination, or a simple voluntary regurgitation of the food into the mouth, among mankind. The German writers upon this subject are numerous, and their collections of cases abundant. But one of the best examples on record is that given by Dr. Slare. —(*Phil. Trans.*, vol. xvii., 1690–3.) The subject was an adult man, in good general health; the rumination regularly took place about a quarter of an hour after eating, at which time the food felt heavy in the lower end of the œsophagus. If he did not ruminate at the proper time, he soon became languid and sick.

It is a question that has raised much controversy, which are the parts chiefly concerned in exciting the stomach to vomit? Haller, and the physiologists of his time, were wont to refer us to the stomach itself. It was the opinion of Mr. John Hunter, that this action is performed alone by the muscles surrounding the stomach, and that the stomach itself is at the time as passive as the lungs in expiration.*

For the determination of this point, M. Magendie lately instituted a series of highly curious experiments, of which a brief account has been given in the Physiological Proem. From these it would appear, that, in nausea, the action is confined to the organ of the stomach alone, or perhaps in conjunction with the œsophagus; that retching is produced by the contraction of the abdominal muscles, and rejection by the contraction of the diaphragm alone, or in conjunction with that of the abdominal muscles; and, consequently, that an emetic does not cause vomiting by irritating the fibres or nerves of the stomach, but, as suspected by Mr. J. Hunter, by means of absorption and irritation of the nerves of the muscles that surround the stomach; or rather by the stimulus produced on the brain, instead of on the stomach, and especially transmitted to these muscles.†

These experiments, however, have since been called in question by M. Portal, as not conducted with sufficient strictness, and leading to conclusions too generally and too hastily drawn. He maintains that vomiting commences by a particular action of the stomach, and is then aided and continued by the action of the abdominal muscles and of the diaphragm: but that, in many cases, this auxiliary assistance is by no means necessary; since, according to his experiments, vomiting may be produced in the stomach when the abdominal parietes have been removed.† And, consistently herewith, Dr. Parr informs us (*Dict. Append.*, p. 101), that the diaphragm "has been wounded, torn, and its apertures enlarged, so as, either by laceration or dilatation, to admit of the passage of the stomach, or a part of the colon, into the thorax without any uncommon symptoms." [In the example of incessant vomiting, recorded by Gondret (*Magendie, Journ. de Physiol. Expér.*, tom. i., p. 280), where the coats of the stomach were found after death indistinguishably blended together, and converted into a homogeneous scirrhous mass, it may be doubted whether the organ itself had any share in the rejection of its contents. In the enormous dilatations of the stomach which sometimes fill the greater part of the abdomen, without any disease or obstruction of the pylorus, some cases and dissections of which are well described by M. Andral, it is easily conceivable, how a slight pressure produced on the stomach by the abdominal muscles, might occasion the frequent vomiting by the partial expulsion of its contents, notwith-

* It has been already explained in the Physiological Proem, that, in vomiting, the pharynx is elevated and the glottis shut; and that, as soon as the contents of the stomach have been expelled, the pharynx again falls, the glottis opens, and a full inspiration takes place.—See Professor A. T. Thomson's Elem. of Materia Medica, vol. ii., p. 187. This work contains many judicious reflections on the views given of this subject by Magendie, Sir C. Bell, Dr. Marshal Hall, and others. The closure of the larynx, and the retention of air in the lungs, according to Dr. Marshal Hall and Dr. A. T. Thomson, prevent the ascent of the diaphragm into the chest; and the pharynx being [illegible], as in the act of deglutition, opens the [illegible] and forces out this

* If emetics always acted by their local stimulating influence on the coats of the stomach, it might be expected that the time which elapses between the taking of an emetic substance into the stomach and its operation, would be much shorter than it is; and Professor A. T. Thomson is of opinion, "that, in every instance, unless from a mechanical irritant, the emetic substance must be taken into the circulation, before vomiting is induced. We know that when tartar emetic is introduced directly into the circulation,—into a [illegible] example—it produces vomiting sooner [illegible] been swallowed."—Op. et vol. cit.,

[illegible] de France, Mai 19, [illegible] Traitement [illegible] 8vo.

standing the paralytic state of its own muscular fibres; the cause to which this author, with great plausibility, ascribed its prodigious dilatation.—(*Op. Cit.*, tom. ii., p. 248.) This, however, was a state of disease; and by no means amounts to a refutation of the doctrine, that, under ordinary circumstances, the stomach itself, as well as the muscles of respiration, assists in the expulsion of its contents. The same observation applies to the curious malformation recorded by Drs. Graves and Stokes (*Dublin Hospital Reports*, vol. v.), in which, though the stomach was lodged in the thorax completely above the diaphragm, continual vomiting attended the patient's illness. This case, with other facts bearing on the different views entertained of the question, seems to justify the conclusion which the editor arrived at in the Physiological Proem.]

Doubtless, a close connexion and sympathy exist between the stomach and its surrounding muscles; and hence, let the irritation commence in whichsoever organ it may, it will be instantly propagated to the other. We have the same proofs of sympathy in the stomach, the ileum, the œsophagus, and the fauces. And we can evidently trace the retrogressive action commencing in different diseases and under different circumstances, sometimes in one of these organs, and sometimes in the other. And we can sometimes, moreover, see this action limited to a particular part; sometimes running through a certain length of the chain, and sometimes through the whole. The idea of swallowing a nauseous dose of medicine, or an irritation of the fauces by a hair, will often excite a retrograde action in the œsophagus alone: a discharge of wind in cardialgy, or of a small portion of acid, or oil, or any other substance floating on the surface of whatever may be contained in the stomach, seems to excite the fibres of the cardia alone, and they are expelled by its simple and unassisted effort, producing a single act of eructation or belching. The sulphates of zinc and copper, and perhaps all the metallic emetics, act unquestionably upon the fibres of the stomach generally and primarily; and probably all the ipecacuanhas, whether of the psychotria, the callicocca, or the viola genus, are first absorbed, as asserted by M. Magendie, and then produce vomiting by irritating the fibres of the surrounding muscles. Seasickness, and various affections of the head, apparently act in the same manner; and the contractile and inverted action only takes place after a paroxysm of intolerable sinking and languor. In ileus, the retrogressive movement, commencing in the bowel which gives rise to the name of this disease, runs with great violence through the whole chain of the alimentary canal; insomuch that medicines introduced into the rectum are rejected by the mouth. In few words, then, "vomiting," to adopt the language of Sir C. Bell, "is an action of the respiratory muscles, excited by irritation of the stomach;"* or, as we should add, of those muscles themselves.

Sickness of the stomach occurs under different forms: the three following are the chief varieties:—

α	Nausea. Loathing.	Tendency to reject, but without regurgitation.
β	Vomituritio. Retching.	Ineffectual effort to vomit.
γ	Vomitus. Vomiting.	Act of vomiting, or rejecting from the stomach.

Sauvages and Linnæus regard the first and third of these varieties as distinct genera of disease, and even arrange them as such. This appears highly incorrect; for, if minutely examined, they will be found, in every case, to be little more than different degrees or modifications of the same affection, produced by a greater or less inversion of the peristaltic motion of the stomach and œsophagus, whatever be the cause of such inversion, and allayed or overcome by the very same means. Where the stimulus, and consequently the degree of inversion, is slight, the effect is confined to nausea; if beyond this, the nausea becomes retching; and then the retching becomes vomiting. They may, indeed, exist separately; for the cause may be of a kind or strength sufficient to throw the stomach at once into a state of violent inversion, and, consequently, to produce vomiting without the common, intermediate changes; as in the case of various metalline emetics, sympathetic irritation from pregnancy, or the swallowing putrid vapour: while, on the contrary, minute doses of squills, or ipecacuanha, or any other cause that produces but a slight degree of action, will excite nothing more than nausea, or the first stage alone of the inverted action upon which the general affection depends.

It is nevertheless curious, and of great importance, to observe the different and opposite effects produced on the animal frame by these two stages of one and the same disease. Nausea lowers the pulse, contracts the small vessels, occasions cold perspiration, severe rigours, and trembling, and diminishes, as long as it lasts, the action and even the general powers

* Experiments on the structure and functions of the nerves.—Phil. Trans., 1822, p. 406. Sir Charles Bell qualifies this theory by observing, "That when the stomach is excited to vomiting, there is consent of the abdominal muscles, by which they are brought into violent spasmodic action; not alternating in their action, as in the motion of respiration, but acting synchronously, so as greatly to assist in compressing the stomach;" but "at the same time, the action of these muscles, however forcible their contraction, cannot alone cause vomiting; nor has this action any tendency to produce such an effect on other occasions, in which the utmost contraction of the diaphragm and abdominal muscles is required for the compression of the viscera." Vomiting is not, therefore, simply an action of the respiratory muscles. Dr. Marshal Hall's explanation of the mechanism of vomiting is this:—"The contents of the thorax and abdomen are subjected to the sudden and almost spasmodic contractions of all the muscles of expiration, the larynx being closed, so that no air can escape from the chest, and the two cavities being made one by the floating or inert condition of the diaphragm."—Ed.

of life. The act of vomiting, on the contrary, rouses rather than depresses; puts to flight all the preceding symptoms, and restores the system to itself.* There are few persons so debilitated as not to bear vomiting, but many who would sink under nausea. It is obvious, therefore, that these two different states of the stomach may be employed as powerful instruments in attacking a variety of general, and even of remote local diseases; this organ being justly considered as the common centre of sympathy, and producing opposite results, according as it is excited to different modes or degrees of action. As nausea diminishes the action of the system generally, and particularly that of the small vessels, it has been often had recourse to with success in inflammation of various organs, particularly of the eyes and lungs; as it has also on the approach of the first fit of intermitting fevers, or the accession of those of a continued type, which threaten a considerable degree of violence. Full vomiting, by augmenting the general action, and consequently giving great additional energy to the absorbent system, has also been very advantageously employed to remove inflammation, though in a different manner; and particularly inflammation of the suppurative kind. Orchitis and purulent ophthalmia have often yielded to it as a charm; and we have various instances, in which the fluid of extensive abscesses has been hereby carried off in a few hours. From the pressive violence of the action, it has also been highly beneficial in many cases of obstruction, or chronic torpitude: and hence its occasional utility in amaurosis and caligo; and still more so in congestions of the liver and other abdominal viscera.†

As different emetics, however, produce not only a different action on the stomach, but also on the system at large or different parts of it, they are by no means to be used indiscriminately, but in reference to the particular object we have in view. This difference of effect depends upon the peculiarity of their *emetine*, as the French writers denominate it, or emetic principle, of which we require further instruction than has been obtained at present; though the experiments of MM. Magendie and Pelletier have given us some information concerning this principle, as it exists in the brown ipecacuanha (*psychotria emetica*), the gray (*callicocca ipecacuanha*), and the white (*viola emetica*). [When given in doses of from a grain to three grains it produces full vomiting; and, as none of the other principles of ipecacuanha root produce this effect, there is no doubt that its emetic power is owing to the emetine, a principle contained in the roots of some other plants, besides those of ipecacuanha.]—(See *Thomson's Mat. Med.*, vol. ii., p. 209.)

The ipecacuanhas, however, though possessing some diversities of power, concur in operating very generally upon the skin, at the same time that they excite the stomach; increasing, in a slight degree, the discharge of mucus from the lungs, and adding a little to the peristaltic motion of the bowels. The antimonial emetics, in a full dose, act more violently upon the stomach, bowels, and skin, but less upon the mucous secernents. While in small doses, the nausea they produce is accompanied with the most deadly languor, and with an atony, that, in numerous cases, has been succeeded with more mischief than any degree of benefit that could have been proposed by their use. "Many in this manner," says Dr. Perceval, of Dublin, in his manuscript remarks on the volume of Nosology, "have sunk under the nauseating doses of emetic tartar, employed, upon the hypothesis of Dr. Cullen, in low fevers. The heart of a frog is so torpified by this antimonial, as not to be excited by galvanism, which is not the case with opium. The fraction of a grain of tartar emetic, in a gouty habit, subject to melæna and palpitation, produced an alarming deliquium. In the same subject, a similar effect attended the use of other antimonials."*

* In vomiting, or the forcible ejectment of the contents of the stomach, the influence of the emetic is carried beyond this organ; for, the secretion of the liver being forced into the duodenum, and passing from that into the stomach, in the act of straining, is also ejected. Besides, by the same act, all the abdominal viscera are compressed; and by a repetition of this cause, the blood is propelled more forcibly through these viscera, and the secretion of the fluids thereby increased and altered. In particular, the blood is propelled through the vena portarum; and, consequently, the secretion of bile is both augmented in quantity, and altered in quality: the gall-bladder and biliary ducts are emptied; the pancreas and spleen are also affected; and the action of the kidneys promoted. The pulmonary system likewise feels the influence on the whole constitution; and the circulation through the lungs is accelerated. But these organs are partly affected by their sympathy with the stomach, and not wholly by the mechanical action of vomiting. Vomiting excites the secreting and exhaling vessels of the lungs, and hence emetics hold a place among expectorants. They produce a change in the secreted fluids of the stomach itself, not only bringing about the evacuation of any superabundant acid, but so altering the action of the secreting vessels, that for a time all trace of acid disappears. See Dr. A. T. Thomson's Elem. of Materia Med., vol. ii., p. 194; a work abounding in valuable matter.—Ed.

† During the action of vomiting, as Professor A. T. Thomson observes, the blood is propelled, not only more quickly through the arteries, but also through the veins. Thus, it is more generally and equally diffused; and, of course, local determinations and congestions are removed. He doubts whether emetics really quicken the action of the absorbents, and is inclined to believe that the impulse communicated by them to the capillaries, has the effect of lessening deposition, and, as the process of absorption goes on at its ordinary rate, collections of fluids, tumours, and thickenings of membranes disappear after the operation of emetics.—Op. cit., vol. ii., p. 195. This latter theory is different from what is commonly entertained.—Ed.

* Dr. A. T. Thomson considers ipecacuanha preferable in every instance, in which the powers of the stomach are required to be maintained, and yet vomiting is indicated; and, in cases of chronic diarrhœa, there can be but one opinion as to the superiority of ipecacuanha over tartar emetic.

The squill and seneka* root act very generally; proving not only emetics, but cathartics and expectorants. The asarum, which was once extensively employed for vomiting both in its root and leaves, at the same time that it inverts the stomach, acts powerfully on the olfactory nerves, and becomes a pungent emetic. It is hence by far the best emetic we can select in affections of the eyes, and several species of cephalea. Hot water operates only as a simple stimulant to the stomach; and hence, unless there be other irritants in its cavity, rarely takes effect till the stomach becomes distended, and the nervous fibres of the pylorus are inordinately excited by the quantity swallowed. If, however, we infuse in the hot water a certain portion of horseradish, mustard-seed, the root of mezereon, or a handful of chamomile flowers, we increase its stimulant power, and a much smaller quantity is sufficient. And it is probable that all these substances act, in like manner, as simple stimulants alone; for, in small doses, they tend rather to take off, than to excite sickness. There is little doubt that air acts in the same way; for some persons, as M. Goss, of Geneva, by swallowing and distending their stomach with air, are at any time able to discharge its contents. The sulphates of zinc and copper, and the more powerful preparations of antimony, are probably simple stimulants also, but of a high degree of activity. They act on the stomach almost as soon as they are introduced; and hence are peculiarly eligible for a rapid expulsion of poisons that have been taken inadvertently. If taken, however, in too large a dose, they become quite as mischievous as any poison they are intended to remove; for they prove violently corrosive to the coats of the stomach, and excite hæmatemesis, or vomiting of blood.† There are some of the alkaline salts that act in the same manner when taken in excess, and throw not only the stomach, but other parts of the system, into violent spasmodic motions. Two ounces of nitre were taken by mistake for one ounce of Epsom salts. An almost incessant vomiting for two days was the result, accompanied with a copious discharge of grumous blood from the excoriated mucous membrane of the stomach; notwithstanding that very large quantities of warm water were repeatedly drunk, and alternated with equal quantities of gruel and mucilage of gumarabic, to defend the surface of the stomach by an artificial mucilage. The patient recovered, but was long afterward subject to chronic spasms, resembling chorea.—(*Buller, in Edin. Med. and Surg. Journ.*, No. 53, p. 34.)

The ipecacuanhas, and, indeed, most of the preceding emetics, excite vomiting as effectually by being introduced into the bloodvessels, and consequently exciting the abdominal muscles through the medium of the brain, as by being conveyed into the stomach. But there are some articles that will produce this effect on being applied to the surface of the epigastric region, or the hypochondria alone; as the oil of croton, tobacco, and, what we should far less expect to possess such activity, the leaves of groundsel beat up into a cataplasm. Mr. Stedman, of Kincross, who, I believe, first published an account of this power in both plants (*Edin. Med. Essays*, vol. ii., art. 5), availed himself of it as a remedy for agues, and parabysmic tumours of the liver.

As the stomach is the common centre of sympathy, it is not to be wondered at that nausea, or sickness, should be a symptom common to a variety of diseases, seated in organs more or less remote from itself. And hence we find it occurring in colic, cholera, stone, the accessions of fevers, repelled gout, and various affections of the head.

The last is, indeed, a very frequent, perhaps the most frequent, of all the sympathetic causes whatever; for nothing can disturb the regularity of the sensorial function without disturbing the stomach; and hence sickness is sure to follow oppression of the brain, whether produced internally by hanging, drowning, or apoplexy; or externally, by a fracture of the cranium accompanied with depression. A severe jar of the brain, as in the case of concussion, even without extravasation, is certain of exciting the same effect. Nay, any slighter motion to which the head has not been accustomed, as that of moving it rapidly from shoulder to shoulder in a half rotary direction, accomplishes the same purpose. And hence we see the reason of the vomiting induced by running, or riding a horse round a small circle; by the act of swinging, or riding backward in a coach; and all the languor and deep regurgitation of sea-sickness. The living frame, however, has a most wonderful instinctive power of accommodating itself to circumstances; and hence, by habit, we are enabled to undergo the new motion without any inconvenience to the sensorium, and consequently without any sickness of the stomach. And this power of accommodation is so considerable, that we have numerous instances of extensive depressions, and even of bullets and other foreign substances lodged in the brain, which, though at first productive not only of incessant sickness, but of the most dangerous symptoms of compression, have by habit been borne without any evil to this organ; and hence, also, without any disquiet to the stomach.

In all these cases, however, the brain must still retain a certain degree of excitability: for, if this be entirely or very nearly lost, neither the

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When deleterious effects arise from over-doses of ipecacuanha, or emetina, the best remedy is infusion of galls, which, by forming an insoluble precipitate with the emetina, renders it inert.—Op. cit. vol. ii., p. 214, 215.—Ed.

* Seneka, or rather senega, root, is highly commended as one of the most certain emmenagogues, by Dr. Chapman, Professor of Materia Medica in the University of Pennsylvania.—Ed.

† This remark must be taken in a limited sense: the vitriolic emetics, particularly those composed of the sulphate of zinc, may be used in doses of two, three, or even four drachms, without particular injury to the stomach, or to the mucous membrane of the intestinal tube. They generally excite great thirst, which must be allayed by the free use of bland mucilaginous drinks.—D.

muscles surrounding the stomach, nor even the stomach itself, possess energy enough to produce an inversion of this organ. Hence, in an extreme state of apoplexy, or asphyxia, there is no vomiting whatever, nor is it possible to excite it in the profuse and sudden exhaustion of the nervous power which follows upon swallowing large doses of the *atropa belladonna*, and various other narcotics; in combating the effects of which, fourteen grains of tartarized antimony have been administered to no purpose. "Now, if, in such a case," says Dr. Paris, "a copious draught of some vegetable acid be given, the emetic will be more likely to succeed." And, agreeably with the principles just laid down, "here, then," says he, "we perceive that the brain, being paralyzed by a narcotic poison, is unable to lend its aid to the muscles requisite for the operation of vomiting, until its energies are restored by the anti-narcotic powers of a vegetable acid."*

In an affection resulting from such an infinite variety of causes, no one remedy or even plan of treatment can apply generally. Sympathetic sickness can only be radically removed by removing the idiopathic disease upon which it is dependant, though it may often be mitigated when very distressing, and the primary disorder is likely to be of long standing. The best palliatives, in most cases of this kind, will be found in carbonic acid gas; the saline draught, as it is called, in a state of effervescence, whether made with lemon juice, or as first proposed by Riverius, with sulphuric acid; the more grateful carminatives; and small doses of opium.†

When the stomach is overloaded, or irritated by bile or any other material that sits uneasily, the offending matter must be first discharged, and then the stomach restored to its proper tone and action by some aromatic cordial, or, if necessary, by narcotics. Food should at first be given in the smallest quantity, and of the lightest kind. A little toast and water alone, taken in small sippings, or a small spoonful of brandy and water, with a single morsel of sopped biscuit, will often sit easy when nothing else will remain; and gradually solicit the stomach to a healthful reaction. Stimulant cataplasms applied to the epigastrium are also frequently serviceable.

When the sickness proceeds from a chronic debility of this organ, the lighter and warmer bitters, as the infusion of orange-peel, cascarilla, or columbo; or, where a more active stimulant is necessary, that of leopard's bane (*arnica montana*) may be found useful. The cinchona [except in the form of the sulphate of quinine dissolved in the compound infusion of roses] rarely agrees with the stomach. The oxydes of zinc and bismuth are frequently useful. Sea-sickness* is only to be cured by habit: yet it has often been rendered less distressing by small

* Pharmacologia, p. 152, 5th edit. 1822.

† When long-continued or frequent vomiting seems to depend upon morbid irritability of the stomach, the hydrocyanic acid, in doses of two or three minims three times a day, is an excellent medicine. The following case, related by Dr. Elliotson, exhibits the efficacy of this remedy. Eliza New had been ill five months, and had vomited every thing she had taken during fourteen days. She had been in a state of amenorrhea for two months, and complained of pain across the epigastrium, and over the whole abdomen. Her tongue showed no feverishness; there was no thirst; no heat in the stomach; no heat in the throat; neither was there tenderness on pressure on any part of the abdomen; nor was the pulse accelerated. Under these circumstances, Dr. Elliotson inferred that it was not a case of inflammation. The patient took the hydrocyanic acid as above directed, without any other medicine, or even being restricted to low diet; her vomiting ceased, and, in a fortnight, she was discharged from the hospital with her health re-established. When there is an affection of the stomach, Dr. Elliotson advises the practitioner to consider, in the first place, whether there be inflammation or not; for, if there be inflammation, the hydrocyanic acid will not cure it; the case must be treated like inflammation of any other part of the body. But, if no inflammation can be detected, nor any cause for the vomiting in any other parts (as irritation in the intestines, the kidney, the womb, and ten thousand distant causes), then the hydrocyanic acid will relieve the vomiting better than any other medicine. As an anodyne, Dr. Elliotson has not generally found it of the least use, except in cases of pain of the stomach. He declares that he has frequently seen vomiting, which has lasted for months, cease on the exhibition of the first dose of this medicine; though, he admits, that some cases of spasmodic vomiting will not yield until it has been tried for a week. He also expresses his belief, that it will prove unavailing unless the distinction be made between the existence of inflammation, and the influence of distant causes on the one hand, and mere morbid irritability of the stomach itself upon the other. He reminds us, that hydrocyanic acid is an exceedingly powerful medicine, and cannot be given in so large a dose when the stomach is empty, as when it is full. If three drops can be given three times a day after meals, it certainly will not be right to give more than one or two drops when the stomach is empty. To avoid all confusion, he thinks it best always to give it after meals, and to begin with one minim diluted with water, or an aromatic water. In the course of a day, if no unpleasant effect be produced, the dose may be increased to two minims; and on the third or fourth day, to three minims; and so on until the desired effect, or some inconvenience, is felt. Although it will relieve the vomiting arising from mere morbid irritability, it will, if given too freely, produce extreme nausea, excessive vomiting, and perhaps violent pain in the stomach.—See Clinical Lect., Lancet for 1830–1, p. 423. In pregnancy, it is very common for the stomach to become so disordered, that life is rendered miserable, and even endangered, by the constant vomiting, and inability to retain any food whatever in the stomach. Hence, in addition to venesection and leeches on the epigastrium, the hydrocyanic acid, strychnine, and conium, are the medicines in which Dr. Elliotson confides.—See Med. Gazette for 1832–3, p. 659.—Ed.

* We have derived much benefit in this distressing affection, by due attention to the diet, to the free state of the alimentary canal, and by the use of effervescing mixtures. Lying on the back in the open air has frequently given us immediate relief. For an excellent paper on this subject, see Dr. Miller's communication in the *Med. Repos.*, vol. iv., p. 34.—D.

quantities of brandy, the aromatic spirit of ammonia, or laudanum.

[Vomiting is frequently only a symptom of disease of the stomach itself. This is the case in chronic inflammation of the organ, in schirrhus of the pylorus, and in ulceration of the mucous coat. When the latter membrane is either ulcerated or merely weakened by any previous morbid change, the effort of vomiting sometimes occasions a laceration of the other coats of the stomach, and a fatal effusion of its contents in the abdomen is the immediate result.*]

SPECIES VII.
LIMOSIS DYSPEPSIA.
INDIGESTION.

THE APPETITE FASTIDIOUS; THE FOOD DIGESTED WITH DIFFICULTY; HABITUAL COSTIVENESS.†

This is by far the most complicated of all the disorders belonging to the present genus. The three preceding species may often be traced by themselves, or in a state of separate existence. Dyspepsy may be regarded as consisting in a combination of their respective symptoms irregularly intermixed; sometimes one set of symptoms taking the lead, and sometimes another; with a peculiar tendency to costive bowels, and especially that species of costiveness which we shall hereafter have occasion to denominate *coprostasis obstipata*, dependant on a weakly temperament or a sedentary habit, and in which the discharged feces, instead of being congestive and voluminous, are hard, slender, and often scybalous.

Dyspepsy, therefore, in the language of Dr. Cullen, may be described as "a want of appetite, a squeamishness, sometimes a vomiting, sudden and transient distentions of the stomach, eructations of various kinds, heartburn, pains in the region of the stomach, and a bound belly." Yet none of these are uniformly present, and all of them seldom. So that, as already observed, the symptoms of cardialgy, flatus, and emesis, with a few others, enter in irregular modifications into dyspepsy, as those of dyspepsy enter into hypochondrias. [Among the most constant symptoms of dyspepsy are, a furred tongue, flatulence of the stomach, and fretfulness, or depression of spirits. They may arise primarily from disorder or disease in the stomach itself; or they may depend upon an affection of the brain, liver, bowels, or some other remote or adjacent part.—(See *Armstrong's Morb. Anat. of Stomach*, &c., p. 68.) The necessity of a careful discrimination of the original affection by the practitioner is quite manifest.]

There is also another complaint, which frequently enters into the multiform combination of maladies, of which dyspepsy is the general expression, and which has rarely been noticed by writers, although it is often a very troublesome symptom, and that is, gravel. In treating of gravel, or lithia, as an idiopathic affection, we shall have to notice, that one of its chief and most common causes is an excess of acidity in the primæ viæ; and, as such excess is almost constantly to be found in dyspepsy, gravel must frequently attend or follow, and is even a necessary effect where there exists what has been called a calculous diathesis. And, for a like reason, where there is a podagric diathesis, gout in some form or other is a frequent concomitant.

The grand proximate cause of the three preceding species is debility of the stomach, whence, among other evils, an impaired secretion of gastric fluid. In the present instance, the debility is not often confined to the stomach, but extends to the intestinal canal, and the collati-

* See J. N. Weekes on rupture of the stomach, in Med. Chir. Trans., vol. xiv.—Lallemand, art. Rupture, in Dict. des Sciences Médicales. Examples are recorded, in which a fluid, containing urea, and having the sensible properties of urine, was vomited. In one interesting case, under Dr. Bright, in the Westminster hospital, the patient, a young woman, had been for three months unable to void her urine without the aid of the catheter. The particulars are mentioned in the Lancet for 1832-3, p. 704.—Ed.

† "Lenteur, difficulté, état pénible des digestions."—(Dict. de Méd. et Chir. Pratiques, vol. vi., p. 387.) Such is M. Jolly's definition. Dyspepsy occurs in so many different affections, and under such a variety of circumstances, that many excellent physicians hesitate to set it down as a distinct and original disease itself. Besides, as digestion is a complex function, in which the action of parts variously organized is concerned, its disorders must be very different in different examples, according to the tissue affected, whether nerve, muscular fibres, or a part or surface designed for secretion. Dr. Abercrombie, in considering dyspepsy, chiefly directs our attention to cases in which the derangement is of a functional nature, or not connected with any change of structure, either of the stomach itself, or of any of the neighbouring parts. The muscular action of the stomach may be deficient, so that the alimentary matters remain in it too long, are imperfectly changed, and undergo chymical decomposition. 2. There may be a deficiency of the corresponding and harmonious intestinal action, interfering with the second stage of digestion, and giving rise to imperfect chylification, and various morbid actions in the upper intestines. 3. The various fluids may be deficient in quantity, or morbid in quality. 4. If the mucous coat of the stomach be morbidly irritable, the muscular coat will probably be too easily excited to action, and substances will not remain in that organ a sufficient time for healthy digestion; but after producing much uneasiness, will either be rejected by vomiting, or propelled in a half-digested state into the intestine, where they prove a new source of irritation. If the irritability occur in the intestine, the articles may undergo the proper change in the stomach, but be propelled too rapidly through the bowels for healthy chylification.—See Abercrombie's Pathol. and Practical Researches on Diseases of the Stomach, &c., p. 73, ed. 2. These views will serve to correct and modify certain doctrines, delivered in the present section of the Study of Medicine. It may be observed, however, that the generality of writers insist on a weak, torpid state of the alimentary canal in dyspepsy, and doubts are sometimes entertained about the soundness of the theory which refers particular forms of this disorder to morbid irritability of the mucous coat of the stomach and bowels, independent of chronic inflammation.—Ed.

tious viscera, as the mesentery, the spleen, the pancreas, and especially the liver, in which it most frequently commences; and hence another cause of the great complexity of this disease.

The debility, and indeed torpitude of the intestinal canal, is evident from the habitual costiveness which so peculiarly characterizes this affection. Whether this be direct or indirect, intrinsic or sympathetic, as harmonizing with the weakness of the stomach, it is not easy to determine: but nothing can be a stronger proof of the great inactivity of the intestinal tube, from whatever cause produced, than the feebleness of its peristaltic motion, notwithstanding the acrimonious matters that are so frequently diffused over its inner surface.

The imbecility of the liver is equally obvious in most cases, from the small quantity of bile that seems to be secreted, or its altered and morbid hue, as evinced by the colour of the feces, which, in some instances, are of an unduly dark, and in others of an unduly light teint; and possibly from the inactivity of the intestines themselves, whose peristaltic motion is conceived by Dr. Saunders and other pathologists to be, in a great measure, kept up by the stimulus of the biliary secretion.

When the mesentery is affected, the chyme is generally obstructed in its passage to the thoracic duct, and the general frame, deprived of its needful nutrition, becomes flaccid and emaciated; and from a collapse of the minute vessels on the surface, assumes a wan or sallow complexion.

It is highly probable that the pancreas and spleen are both also affected in many cases of dyspepsy. Of the actual part taken by either, in the process of digestion, we have already had occasion to observe that we know but little: but we do know that the pancreas pours forth a considerable portion of the fluid which holds the solid part of our aliment in solution: while, in most of the cases of dyspepsy brought on by a habit of drinking spirituous liquors, the spleen is evidently affected as well as the liver.

It is in this state of the disease that we frequently meet with that tenderness or other uneasiness in the epigastric region, and that peculiar hardness of the pulse, often accompanied by febrile symptoms, which Dr. Wilson Philip has pointed out as pathognomonic of what he calls a second stage of the disease.—(*Treatise on Indigestion*, &c., p. 41, 8vo. London, 1824.)

It has also been well observed by Dr. Philip (*Op. cit.*, p. 323), that the lungs are, in many instances, apt to associate in the morbid action of the digestive organs, when it has become chronic, and to produce, as a result, a peculiar variety (with him *species*) of consumption, to which he has given the name of dyspeptic phthisis. The dyspeptic character of the disease, however, and especially the hepatic symptoms, together with those of lowness of spirits, flatulence, and other hypochondriacal affections, rarely fail to accompany it when complicated with phthisis, and point out its real source; and the cure must be chiefly directed to the primary malady, how much soever the induced symptoms may also demand our attention; for it will be in vain to subdue the latter, while the former is still suffered to bear sway

It must nevertheless be admitted, that in some instances the secondary disease seems to afford relief to the primary, and that the organ first affected recovers its health in proportion as that subsequently affected yields to the attack; in the same manner as, in erysipelas and the migratory forms of herpes, the eruption travels forward, the part relinquished heals, and fresh parts are affected in succession. In all such cases, the secondary complaint becomes a new malady, and must often be followed up under another principle and another mode of treatment. And, not unfrequently, we can very advantageously take a lesson from this peculiar march of nature; and, by exciting an artificial irritation in some neighbouring and less vital part, can draw off the morbid action into such quarter. It is by this means that blisters, setons, and other counter-irritants are so frequently found productive of the best advantage. And as a disease of the alimentary canal is thus sometimes communicated or transferred to the lungs, so a morbid state of the lungs is sometimes extended to the stomach, of which Dr. Gardiner has lately furnished us with a striking example.—(*Trans. of the Medico Chir. Soc. of Edinburgh*, vol. i., 8vo. 1824.)

In chronic inflammation of the stomach, and even in that form of it which terminates in ulceration of the organ, and a fatal effusion of its contents in the abdomen,* we also meet with several, and sometimes all the symptoms of dyspepsy; but as dyspepsy occurs here merely as a secondary or induced affection, it will be more regular to examine the nature and effects of this cause hereafter.

Under whatever form, and from whatever cause the disease occurs, there is a considerable degree of general languor and debility. Exercise or exertion of any kind soon fatigues; the pulse is weak; the sleep disturbed; the extremities are cold, or rendered so on slight occasions; and the tongue for the most part is furred, or covered with a creamy mucus, in the morning. Yet this last symptom is not always to be depended upon; for it is sometimes wanting in the disease, and sometimes common to those who have no such disease whatever, and are in the enjoyment of habitual health.

That dyspepsy should be connected with a morbid condition of any of the adjoining organs, is by no means difficult to conceive, when we reflect that they are all concerned, directly or indirectly, in completing the great object of the digestive process, which is that of furnishing a constant supply of nutrition for the system at large. Digestion is commonly supposed to take place in the stomach alone; but this is an erro-

* See Abercrombie on the Pathology of the Stomach, &c. in Edinb. Med. and Surg. Journ., No. 78; also in his Pathological and Practical Researches on Diseases of the Stomach, &c., p. 17. ed. 2. Edinb. 1830; Elliotson's case of ruptured stomach, in Med. Chir. Trans., vol. xiii., p. 31; also Louis in Archives Gén. de Méd., tom. v.

mucous view, though the stomach may be regarded as the chief link in the great associate chain. In the stomach, as we have already seen in the proem to the present class, the food is only broken down into the pultaceous mass called chyme, and thus converted into the mixed principles of oil, gelatine, and sugar, and little else; for, though we have some traces of animalization, they are rudiments, and nothing more. Yet this, which is the first, is the most important stage of digestion; and its perfection depends upon the vital power. Where this is small or enfeebled, the process of chymification is necessarily impaired or interrupted: the wonderful machinery of the stomach, which finds no parallel, not only without the body, but in any other part of it, is disturbed or impeded in its operation; and its fluids are poured forth too sparingly or too inconditely.

The next stage of the digestive process takes place in the duodenum, which easily admits of distention, and receives the food in the form of chyme from the stomach. Here the bile, the most highly animalized of all the secretions, and abundance of the pancreatic juice, meet it, and a new play of affinities commences; the bile, as supposed by Fourcroy, being separated into two parts, its saline principles and its resin. The latter is discharged with, and gives a colouring matter to, the excrements; the former become decomposed, attenuate the chyme, communicate their azote, and thus complete its animalization; while the juice of the pancreas dilutes and holds the material in solution, and probably contributes to some other effect, but which has not yet been detected. In this liquid state, it is called chyle. The recrementory part, which descends into the larger intestines, is attacked, as it proceeds, by the mouths of a considerable number of lacteals, that drink up whatever small quantity of the chyle may be accidentally intermixed with it; while the great body of this fluid is absorbed in the duodenum itself, by an innumerable host of the same vessels which concentrate their mouths on its inner surface.

We thus see how largely the digestive process ranges, and from what a wide spread of organs, closely sympathizing with each other, the disease of dyspepsy may proceed. But the finishing touch still remains to be added: the absorbed chyle, before it becomes completely assimilated, has to be exposed to the action of the atmosphere, and for this purpose has to travel to the lungs. What change it sustains in consequence of this exposure, will be the subject of a subsequent inquiry. At present it is sufficient to show the connexion which subsists between the stomach and the lungs in the common function of providing for the sustenance of the animal machine; and to indicate the means by which a morbid action of the former may be communicated to, or lay a foundation for impaired action in, the latter; since, to say nothing of the sympathy of approximation, or of that sympathetic influence which is always found to take place between the extreme links of a chain that runs through any part of the animal machine, it must be obvious that if the chyle, which originates in the stomach, and, when in a state of health, communicates a peculiar stimulus to the lungs, as it enters their substance in combination with the recurrent and exhausted blood, should be conveyed to them in an unhealthy condition, this peculiar stimulus may be changed in its mode or degree of action, and the lungs, in consequence, become a sufferer; more especially where they are predisposed to any kind of morbid action. And hence another origin of dyspeptic phthisis, which, like every other modification of the disease, may depend, therefore, upon imbecility of one or more of the digestive organs.

The common causes of this imbecility, whether confined to the stomach, or co-extensive with the associate viscera, may be contemplated under two heads, *local* and *general*; under both which they are still further resolvable into the two opposite extremes of deficient and excessive stimulation; and, consequently, into a divergence of any kind from that medium of excitement and activity, upon which health is made to depend.

The local remote causes are, a too large indulgence in sedative and diluting substances; as tea, coffee, and warm water, or similar liquids taken as a beverage; or an equal indulgence in stimulant and acrid materials, as ardent spirits, spices, acids, tobacco, whether smoked or chewed, snuffs, a daily habit of distending the stomach by hard eating or drinking; or a rigid abstemiousness, and very protracted periods of fasting.*

The general remote causes are, an indolent or sedentary life, in which no exercise is afforded to the muscular fibres or mental faculties Or, on the other hand, habitual exhaustion from intense study, not properly alternated with cheerful conversation; becoming a prey to the violent passions, and especially those of the depressing kind, as fear, grief, deep anxiety; immoderate libidinous indulgence; and a life of too great muscular exertion. Perhaps the most common of this latter class of causes are, late hours and the use of spirituous liquors.

Dyspepsy is hence presented to us under several varieties, of which the two following are the chief:—

* The following facts are noticed by Professor Elliotson, in proof of the great length of time certain substances will remain in the alimentary canal, and be the cause of various complaints. In the Philadelphia Journ. for 1822, there is an account of a coagulum of milk, which was vomited two months after it had been taken. Dr. Elliotson has seen a coagulum of milk, like birdlime, which had remained a week in the stomach, producing the greatest uneasiness. Dr. Barlow has recorded an instance, in which sulphate of iron pills were discharged, per anum, a year after they had been taken. Dr. Elliotson has seen a piece of salmon vomited by an infant, a month after it had been swallowed. A boy swallowed thirty grapes without chewing them, and after three months' frequent vomiting and severe suffering, he was cured by an active purgative medicine; ten of the grapes came away whole even then.—Lect. at London University, in Med. Gazette for 1832-3, p. 660.—Ed.

α Organica. Organic indigestion. — Originating in the digestive organs, and principally confined to them.

β Enervis. Enervative indigestion. — Originating in a relaxed state of the constitution from causes acting generally.

For both these, the general principles that should govern us in attempting a cure are the same, though the means of carrying such principles into effect will admit of diversity.

Under what shape soever the disease may present itself, the first thing to be enjoined is a relinquishment of whatever cause has laid a foundation for it; we must next palliate the symptoms that aggravate and continue the disease; and, lastly, we must restore the debilitated organs to their proper tone; or, in other words, we must correct or remove what is called, though not very precisely, the proximate cause of the malady.

The patient must, in the first place, be convinced of the necessity of putting himself under a new rule of conduct, and be deeply impressed with the idea that, though he may have continued his late plan of life for a considerable period of time without having sensibly suffered for it, yet, now that he is suffering, nothing but his conforming to another plan will remove his present complaint.

Severe and long continued study,* protracted, as I have often known it, through ten hours a day for many months, without any relaxation or interchange of pursuit, must give way to the exercise of walking or riding, and this not occasionally, but daily; and to the still better cordial of cheerful conversation. The last is of very great importance; and without it even exercise itself will be of little avail: for the mind, accustomed to a certain track of intellectual labour, will otherwise relapse, even while riding or walking, into the same habitual course, be dead to the most fascinating prospects around it, and become exhausted by its own abstraction. And it is to characters of this kind, perhaps, more than to any other, that the amusements of a watering-place promise ample success; where the general bustle and hilarity, and the voluntary forgetfulness of care, the novelty of new scenes and new faces, and new family anecdotes, and the perpetual routine of engagements, that fill up the time with what would otherwise be trifles and frivolities, reverse the mischievous order and monotony of the past, break the sturdy chain of habit and association, and give leisure to the worn-out sensory to refresh itself.

Where the same effect has proceeded from a town life of fashionable follies and dissipation, nothing is more common than to recommend a like change of residence; but in this case, though it may be a change of residence, it is not a change of life; and hence it is too often made without any benefit whatever. A total retreat from the world, the unbroken seclusion of a remote hamlet, the sober society of a few intimate friends, simple meals, and early hours, instead of close and heated rooms, crowded and motley routs, costly feasts, and midnight madrigals, are what are specially called for in this instance, but are not always to be met with in the resort of a watering-place. In such as are still distinguished for their quiet and unfrequented shores, where all is rude and simple, and spruce squares and long-drawn parades have not yet put to flight the scattered and irregular cottages of former times, these advantages may still be obtained. But it is rarely that patients, who are suffering from a life of dissipation, will consent to relinquish the higher attractions of our gayer and more public retreats, for what they are apt to esteem the dulness of an unfrequented coast, till it is of little importance whether they go anywhere, or remain at their own homes.

In like manner, the habitual use of hard eating and drinking must give way to a wholesome plainness of diet; though I am afraid that not a little mischief has often ensued from rigidly compelling the man, who is suffering from a long habit of the former, to abandon this habit at once, and run to an extreme of abstemiousness. Nothing can be more injurious. Even in full health, the animal frame, though it may be brought to any extreme by degrees, very ill brooks abrupt changes; and I have often seen, where such changes have been attempted in an enfeebled constitution, that they have introduced worse complaints than they have been intended to remove. The use of tobacco is not, in our own day, employed very often to such excess, whether in smoking or chewing, as to become a very alarming cause of dyspepsy: but I have known instances where the former has been suspected, though perhaps unjustly, of having been the cause of this complaint, and where an abrupt prohibition of its entire use has introduced a dangerous atrophy.

It is certain, however, that a free use of tobacco, under either or any form, has produced very severe dyspeptic affections; and, consequently, in such cases it ought to be relinquished by degrees. Nor is it difficult to conceive by what means tobacco thus acts; for, like opium, it is a stimulant readily producing a narcotic effect, or, in other words, rapidly exhausting the sensorial power. In chewing, a considerable portion of tobacco is conveyed to the stomach along with the saliva: in smoking, a somewhat smaller quantity is conveyed in the same manner; and in both, the salivary glands are excited to a great waste of secretion; which cannot take place without impairing the chymifactive process indirectly, as the introduction of the tobacco into the stomach impairs it more immediately. The areca, or Malabar nut, though a good bitter, when chewed for a long time, is well known to impair it in the same manner. Even in the form of snuff, tobacco has not un-

* "Le cerveau est, sans contredit, l'organe dont les affections réagissent avec le plus d'énergie sur l'état des digestions.—Il suffit même que le cerveau, fortment préoccupé, n'apporte plus à l'acte de la digestion le concours de son influence, pour qu'il y ait dyspepsie."—Jolly in Dict. de Méd. et Chir. Pratiques, t. vi., p. 387.—ED.

frequently been found to produce the same result; partly, perhaps, from the paresis of the olfactory nerves, in which the stomach participates by sympathy, and partly from the portion of tobacco that is constantly passing into it from the nostrils. "I have found," says Dr. Cullen (*Mat. Med.*, vol. ii., p. 275), "all the symptoms of dyspepsy produced by snuffing, and particularly pains of the stomach occurring every day. The dependance of these upon the use of snuff became very evident from hence, that, upon an accidental interruption of snuffing for some days, those pains did not occur; but upon a return to snuffing the pains also recurred; and this alternation of pains of the stomach and of snuffing having occurred again, the snuff was entirely laid aside, and the pains did not occur for many months afterward, nor, so far as I know, for the rest of life."

Dr. Cullen tells us in another place (p. 274), in proof of the same fact, but in proof, also, that the habit is sometimes variable in its influence, that he knew a lady who had been for more than twenty years accustomed to take snuff, and that at every time of day; but who came at length to observe that snuffing a good deal before dinner took away her appetite; and that even a single pinch taken at any time in the morning, destroyed almost entirely her relish for that meal. When however she abstained entirely from snuff before dinner, her appetite continued as usual; and after dinner, for the rest of the day, she took snuff pretty freely without any inconvenience.

Not in manner of life alone, but in manner of food, should we rigidly proscribe whatever we find to be a cause of indigestion. And hence dyspeptic patients should pay a particular attention to themselves, so as to discriminate between the viands that sit easy on the stomach, and those that render it uncomfortable; for nothing in a morbid state is more capricious than this organ, and twenty different cases may perhaps demand as many varieties of regimen. Thus tea of all kinds, and especially green tea, is generally accounted a narcotic. Dr. Smith and Dr. Lettsom endeavoured to trace up its narcotic principle by experiments, and it is to this principle that Dr. Cullen ascribes the deleterious effects it produces upon some stomachs. Yet while it acts as a narcotic upon many persons, upon others, and myself among the rest, it proves powerfully agrypnic; and, if taken on going to bed, keeps up wakefulness through a great part of the night.*

We must first then prohibit, in our endeavours to effect a cure, whatever we know to be a local or general cause of the disease. Our next intention should be, to palliate the symptoms that aggravate and continue it.

As the stomach is often overloaded with crudities and acidity, Dr. Cullen recommends an emetic at the outset. I have rarely found this of use: it often adds to the debility of the stomach; and at most is only of service for a few hours. For so long as the cause continues by which an accumulation of undue materials is produced, this effect will be perpetually taking place, and an emetic might be necessary every day.* The most rational mode of prevention is, to limit the stomach to such food as it will most easily digest; to allow it in small quantities; to quicken its removal by gentle aperients that may increase the peristaltic action, and warm tonics that may invigorate the digestive organs. A spare diet, however, though often recommended, is rarely found of service, and very generally adds to the disease: for as the stomach and bowels have been accustomed to the stimulus of food, and a certain degree of impletion, if this be not maintained the atony will be increased, the natural function still further impaired, and all the symptoms of uneasiness be aggravated. A moderate proportion of excitement and impletion is hence imperiously called for; and our discretion is principally to be exerted in determining the nature of the viands and the degree of impletion which will best agree with the stomach, and which it may most easily master.

For the correction of flatulence, most of the carminatives noticed under the fifth species of this genus may be conveniently employed; and for that of acidity, limewater, the acidulous alkaline waters, the carbonates of soda and potash, and the absorbent earths. Magnesia is a remedy of peculiar value for this last intention. In some cases of great obstinacy, but evidently dependant upon a chronic tendency to an acetous fermentation, magnesia, given in the proportion of an ounce a day, has effected an entire cure;† and in all cases it resists the costiveness as well as the acidity, and is far less disposed to coacervate in the alimentary canal, than the calcareous earths. It is also, as I have already observed, a powerful antidote against that class of calculous concretions in the kid-

* Among the causes of indigestion deserve to be enumerated, imperfect mastication from loss of the teeth, or from the habit of swallowing the food too rapidly; sympathy of the stomach with the uterus, brain, kidney, or other organs, and violent emotions of the mind. Then, as Professor Elliotson justly observes, with reference to dyspepsy dependant on the stomach and intestines, there may be either a real debility of them, an inflammatory state, or an organic disease of them: excesses at table debilitate and destroy the tone of the stomach. Chronic inflammation of this organ is likely to be brought on by constant irritation of it. When organic disease occurs, the cardia, or pylorus, is generally the seat of it; but there may be ulceration, or a thickening, or a softening, of the texture of any portion of the stomach.—See Med. Gazette for 1832-3, p. 658.—Ed.

* On this point, Dr. Elliotson's advice is judicious:—"Suppose that any thing injurious in its quality, or in its quantity, is the cause, the shortest way is to give an emetic, and empty the stomach, and *it is much best to give one that does not produce nausea, but an evacuation.* The sulphate of zinc is as safe as any you can exhibit." In fat, short-necked subjects, he recommends bleeding to be practised before an emetic is given, which is to be followed by the exhibition of calomel, senna, and salts.—Ed.

† See Dr. Watson's communication, Medic. Observ., vol. iii.

neys and bladder that depend upon an acid principle.

The eructations that occur in dyspepsy, however, are not always acid. They are often of a compound and very offensive taste, and give to the breath the smell of carburetted hydrogen gas, or rotten eggs: as though the gastric juice were incapable of performing its proper office, and the food were retarded in the stomach till the process of putrefaction had commenced. In this case, instead of avoiding acids, we should recommend a free use of them, from whatever quarter they may be obtained; as they not only tend to correct the fetor, but to strengthen the stomach. The mineral are the most powerful; and of these the sulphuric is by far the pleasantest. It may advantageously be employed as a medicine; but for acidulated dietdrinks it must yield to the vegetable acids. These are of three kinds, native, distilled, and such as are obtained by fermentation. The first are commonly the most grateful, and especially when they exist in the form of fruits; but they are apt in weak stomachs to set free a large quantity of air, and consequently to produce a very troublesome flatulence, and even promote the acescent disposition of the organ. The citric and the oxalic may be exceptions; and there may be also a few others, but they are not numerous; and where these cannot be procured, we must have recourse to the acids elaborated by distillation, or a fermenting process. The last are called vinegars, whether obtained from malt, weak wines, or sugar; and being of themselves, when properly refined, very pure and dilute, they are capable, with a little care, of being rendered highly grateful.

Costiveness is a symptom of dyspepsy still more common than acidity, and one that requires a very vigilant attention. In our attempts to remove it, we should always bear in mind that it is a chronic and not a temporary concomitant; and, consequently, that violent purgatives are of all things to be avoided; and that such aperients should be preferred which act gently, and rather by soliciting the peristaltic motion of the bowels to the regularity of health, than by irritating them to a laborious excitement.

Rhubarb is, for this purpose, one of the best articles in the Materia Medica; for, while by its aperient power it relieves the present distress, we cannot have a much better tonic than its bitter. Where the bowels are merely sluggish, it will prove sufficient without any other cathartic; though it is better to combine it with soap and such aromatics as agree with the patient. It is often however incompetent of itself; and in such cases derives, in the form of an extract, a valuable assistance from half the quantity of the extract of aloes, or the compound extract of colocynth.*

Since the publication of M. Daubenton's little tract in an English dress, very small doses of ipecacuanha, not exceeding a grain or a grain and a half, have been extensively tried, upon the recommendation of this celebrated physiologist. The intention appears to be that of exciting a change of action in the secernents of the stomach; but notwithstanding the advantage which is said to have been derived from this medicine by the writer himself, it does not seem to have succeeded in this country; and, indeed, the dose is so small, that little effect of any kind seems capable of being produced by its use. By some writers it is supposed that, in such minute proportions, it will slip over the pylorus, and prove aperient by acting on the intestines. I have rarely, however, found it to do this alone, though it is a useful auxiliary with aperients of a more decided character. And where there has been great irritability of the stomach, I have known it even in the dose of a single grain excite so much nausea as to prohibit its further use. Far more service has occasionally been produced by an external application of the tartar-emetic ointment, made in the proportion of four scruples of the tartarized antimony to an ounce of spermaceti cerate; the quantity of a hazelnut being rubbed in every night till the eruption consequent upon this application appears. In numerous diseases of the digestive organs, and particularly those of the stomach and liver, this kind of counter-irritation has been found highly useful, probably from the influence which is often produced through the whole length of a nervous fibre and its connecting branches or intersections, in consequence of exciting its extremity. It is to Dr. Jenner we are chiefly indebted for the attention which has lately been bestowed upon the nature and effects of this singular remedy, though it was occasionally in use long before his time.

The quicksilver, or blue pill, will also generally answer a good purpose; but it is chiefly to be employed where we have reason to apprehend that the one or both the portals of the stomach, and especially the pylorus, is in a scirrhous state; or that the dyspepsy is connected with a morbid condition of the liver, or some other allied viscus. In this case, much benefit has also been derived from the white oxyde of bismuth, now more generally known as a cosmetic, under the name of *pearl-white*. For scirrhous affections of the stomach it has been tried successfully by Carminati, of Pavia;

* One thing particularly advised by Dr. Abercrombie is, to regulate the bowels by the daily use of very small doses of laxatives, combined with tonics, so as, without even purging, to imitate at all times that moderate but regular action, which attends the most healthy state of the bowels. For this purpose, various combinations answer; such as columbo powder, with carbonate of potass, and a few grains of rhubarb, taken once or twice a day; sulphate of iron with aloes; sulphate of quinine with aloes or rhubarb, and a few grains of ginger; oxyde of bismuth with rhubarb or aloes.—See Abercrombie, op. cit., p. 79. Dr. Elliotson considers one of the best remedies for this state to be a very minute quantity of croton oil—about 1-12th, 1-6th, 1-4th, or 1-3d of a drop, given regularly with rhubarb and colocynth; and, if it should gripe, a small quantity of aromatic oil should be added. The patient may take a pill of this kind every night, and one copious stool will be produced by it in the morning.—(See Elliotson's Lect. in Med. Gaz. for 1832-3, p. 660.)—ED.

and apparently with equal advantage in France. (*Beaumé, Journ. de Méd.*, tom. lxxiv.; *Heufland, Neue Annalen*, band i.) Independently of its discutient power, it has the virtue of allaying irritation in general; and on this last account, Dr. Odier, of Paris, has employed it satisfactorily in most of the acute diseases of the alimentary canal, especially in pains of the stomach, diarrhœa, and colic, as he has also in hysteria, and even in toothache.—(*Journ de Méd.*, tom. lxviii.) The best form of giving it is that of pills, in doses of from four to ten or twelve grains, four or five times a day.

In the meanwhile, we must never forget that our primary object is to restore the stomach, or the system at large where the stomach is only secondarily affected, to its proper tone and strength.

The general plan, as I have already hinted, must be the same; for, as the virtues of medicines can only be communicated to the system at large through the medium of the stomach; and as the state of the latter has at all times a powerful influence upon the former; there can be little doubt that, by improving the digestive function, the vigour of the system will be improved generally at the same time, and consequently that the energy of the whole of the moving fibres will be increased: while the collateral means of cure that are applied externally, as those of air, exercise, and sea-bathing, and which are chiefly designed to operate on the system at large, will convey an equal advantage to the stomach.

The principal evils we have to encounter in dyspepsy are, deficient action, and a relaxed state of the fibres. For these, there are three classes of remedies to which we may have recourse; stimulants, to increase the action; and bitters and astringents, to augment the tone. The first, however, are of a very doubtful advantage: for a lax state of fibres will bear very little increase of action without incurring an equal increase of debility; and hence stimulants can never be recommended alone, except in cases of emergency, as to remove a severe fit of pain or other inconvenience, and then only for a short period of time; but they may be combined very advantageously with either astringents or bitters, and particularly with those medicines that possess these qualities jointly.

Bitters, besides restoring tone where it is wanted, have another and more immediate advantage in the disease before us: for they directly attack that tendency to fermentation in the stomach which is one of the most prominent features of dyspepsy, and which is, indeed, the chief cause of the flatulence and acidity that so generally accompany it. Of this we have no doubt; for the experience of every day brings its testimony; and we employ bitters, as hops and quassia, for this very purpose, in our fermentable beverages.

Stimulants, astringents, and bitters, are then the three classes of medicine with which we are to make inroad against the intrenchment of dyspepsy. They may often be conveniently united, and have their forces hereby increased in a more than double proportion. The stimulants, indeed, ought rarely to be employed by themselves, except in spasmodic pains, or some other temporary extremity. Many of these may be found in the list of carminatives already described under the species Cardialgia.

I have observed that dyspepsy is often grafted upon an hysterical or hypochondriacal disthesis; and in these cases, we may indulge in stimulants of a much warmer character, as camphire itself, asafœtida, the alliacea, the spicy aromatics, and even capsicum. Of the last it may be remarked, that, though the hottest of all the peppers, it has a less tendency to produce complaints of the head than any of the rest. It is one of the best carminatives possible in the case of flatulence from vegetable food, and admirably calculated to remove that stony coldness, which distresses a weakened stomach when attacked by a transfer of gout.

In selecting from among the simple bitters, we need not be particularly nice, for their principle is the same; the quassia perhaps possesses it in the highest degree, though some have doubted of this; then the gentians; and next to these columbo. Of the gentians the most powerful seems to be the *g. purpurea*, first imported into this country by Dr. Home, from Norway, and then known by the name of cursuta, from its Norwegian name skarsote. As a simple bitter it is best to unite it with some aromatic. The tincture of gentian of the London College, which is an improvement upon Stoughton's or the stomachic elixir, by exchanging the cochineal for the smaller cardamom seeds, is an excellent form for occasional use; but as alcohol should be habitually abstained from in the disease before us, it cannot be employed alone in such quantity as to promise any real benefit, though it may be allowed to enter as an ingredient into more compound remedies.

The bitter of the columbo is combined with a slight and not disagreeable pungency, and has an aromatic smell. It is hence peculiarly calculated for dyspeptic affections, and in most cases will sit easy on the stomach in the form of powder, in doses of fifteen or twenty grains; and will often give a check to sickness where bile is not present, more than any other medicine we can employ. It is singular, that, to the present hour, we are unacquainted with the plant that furnishes this excellent drug. Commerson believed it to be a species of menispermum; and Willdenow a species of bryonia. [Formerly, the root was erroneously supposed to be named from the capital of Ceylon, which was regarded as the place from which it was exported. But according to Dr. A. T. Thomson, it is now known to be a staple article of export with the Portuguese at Mozambique, whence an entire root was taken to Madras by M. Fortin, in 1805, and a plant raised from it there by Dr. Anderson. From a drawing in the possession of the Linnæan Society, the plant appears to be of the natural order of Menispermeæ; but the genus cannot be determined, in consequence of the female flowers not having been as yet seen.—(*London Dispensatory*, 2d

ed., p. 78.)] It seems to have been first noticed by Redi in 1685.—(*Experimenta*, &c., p. 142.)

As a plant uniting the two principles of an essential oil, warm without being unduly stimulant, and a powerful bitter, the chamomile is, for the purpose before us, one of the best remedies. It may be taken in a watery infusion, or an extract; but if in the former, the menstruum should be closely covered, that as little as possible of its volatile aroma may fly off; and the infusion should not be continued for longer than an hour; and perhaps a shorter period may suffice.

As we have medicines that unite the two qualities of bitterness, and a stimulant or aromatic warmth, so we have those also that unite the two qualities of a bitter and an astringent; of which the cinchona furnishes us with a striking example: and hence this medicine has been long, and deservedly, one of the most popular of any for debilities of all kinds, whether of the digestive organs alone or of the system generally. The cascarilla bark has pretensions of a like kind, but far inferior in degree, notwithstanding the high encomiums that have been paid to it by the Stahlian school, which endeavoured to hold it up as a rival to the cinchona. There are many stomachs, however, which will not bear the latter, even in decoction or infusion; and in such cases, either the sulphate of quinine, or, in lieu of this, the cascarilla, may be prescribed.

The acids, both mineral and vegetable, are valuable astringents in particular states of the stomach resulting from dyspepsy; but, it is obvious, that, from the tendency of this organ to co-operate in so many cases in the production of a superabundant acetous fermentation, acids cannot at all times be had recourse to. I have occasionally, indeed, employed the mineral acids, and particularly a mixture of the nitric and muriatic acids, in the proportion of one part of the former to two of the latter, for the purpose of checking this tendency to acidity, in several instances with success; but the plan has not answered generally; and it will hence be better to limit this class of medicines to the intention I have already pointed out, or to delay them till we have by other means overcome the disposition of the stomach to this morbid action.

The other mineral astringents which have been employed besides acids are not numerous, and may be limited to the preparations of iron and zinc. As general tonics, these, under different forms, have proved very extensively successful; but they are less adapted to dyspepsy proceeding from primary imbecility of the stomach or its adjuvant organs; or, I should rather perhaps say, that they are apt to disagree with these organs till they have been restored to some increased degree of tone, beyond what they usually possess when medical aid is sought for.

I have observed, that there is always some degree of acid existing in the stomach in a healthy state; and we have seen, that one of the most troublesome symptoms of dyspepsy is a morbid increase of this principle. And hence, upon an idea that the acid, if thus formed in the stomach, may of itself be sufficient to answer the purpose of the sulphuric, and reduce the particles of the metal to a due degree of tenacity, both the zinc and the iron are also frequently employed in the simple form of filings, rust, oxydes, or calces; and often with the happiest success. And that an acid adequate to this end does in most cases exist in the stomach is sufficiently proved where the rust of iron is employed, by the black colour of the stools, which may be regarded as a test of the proper solution of the iron; as it may be also of the existence of bile in a state of healthy bitterness: for it is by a combination of the iron with the bitter principle of the bile that this blackness, which is a natural ink, and obtained by the same means as artificial ink, is produced. Some animals have a power of forming this sort of natural ink at option, as the sepia or cuttle-fish, but whether by a solution of iron, I cannot undertake to say. This, however, is very probable, if it be used, as it is generally understood to be by the Chinese, as an ingredient in the manufacture of Indian-ink. The cuttlefish, when exposed to danger from the attack of an enemy, throws it forth very freely, employing it, indeed, as a means of defence; and effecting his escape by thus converting the water around him into a black muddiness, that sufficiently conceals him from view.

It is on this principle that the flowers or oxyde of zinc have, by many physicians of great reputation, been preferred to the sulphate; and it is certain, that, in the form of an oxyde, we can introduce a much larger quantity either of zinc or iron, than in that of a salt: but it does not follow from this fact, that the metal may be more efficacious; for, from the doubtful measure and strength of the acid existing in a free state in the stomach, there may not be enough to dissolve or form a salt with the whole of the dose, and consequently a considerable portion of it may be lost, or remain inert. And, on this account, I think it better to have recourse at once to the sulphate of both these metals, whenever it is judged expedient to employ them, than to trust to the chymical changes that may take place with so much precariousness in the stomach.

In employing the metallic salts, and, indeed, tonics of every kind, in disabilities of the stomach, it is a good rule to begin with small quantities, and advance to a full dose by degrees; thus reversing the method that it may often be found advantageous to follow in acute diseases, when the life of a patient may depend upon a bold practice, adopted instantaneously, and gradually remitted, as soon as the object has been obtained. The chronic character of dyspepsy, on the contrary, allows us time; and as no two stomachs will perhaps bear the same precise dose of a remedy with the same precise effect, on account of the caprice of this organ in a deranged state, it is better to feel our way before us, and to reach the proper point by degrees; for if we over-dose the patient at first, we add to the disease instead of opposing it, and require many days, perhaps weeks, to bring him

back to the actual state in which we found him.

In conjunction with this internal treatment, it is probable, also, that an external application of the voltaic power to the stomach may increase its energy. In the hands of Dr. Wilson Philip, it appears to have been of decided advantage.

[According to the reports of Dr. A. T. Thomson, Dr. Granville (*On the Hydrocyanic Acid in Pulmonary Consumption*, &c., 2d edit., 8vo. 1820; also, *Farther Observations*, &c., 1819), and Dr. Elliotson,* the prussic or hydrocyanic acid is a valuable medicine in dyspepsy, connected with morbid irritability of the stomach. Eighty years ago, it seems that nurses were in the habit of relieving the flatulence of infants by putting into the pap a laurel-leaf (*Langrish, Phys. Exp. on Brutes*), the virtue of which is supposed to have depended upon its containing a minute quantity of the acid under consideration. This remedy, however, was distinctly praised by Sprengel (*Pharm.*), in 1814, for its good effects in complaints of the stomach, dyspepsy, and hypochondriasis; and even at earlier periods, for these and other cases by Hufeland, Haller, Swediaur, and others. The dose for commencement may be one minim of the diluted acid, thrice a day, gradually increased to three. Strychnine, hyoscyamus, and conium, are other medicines calculated to lessen morbid irritability of the stomach: in the case which attends pregnancy, venesection, leeches to the epigastrium, and either some of these medicines or the prussic acid, may be tried.—(*Med. Gazette for* 1832–3, p. 659.) One of the most distressing symptoms, sometimes attending dyspepsy, is uneasiness in the chest, with occasional fits of palpitation; while, in primary organic diseases of the heart, many of the most troublesome symptoms of dyspepsy also occur, particularly flatulence. In such cases, Dr. Macleod (*Med. Phys. Journ.*) recommends the exhibition of hydrocyanic or prussic acid, as a means by which the patient's sufferings may be considerably lessened. In one instance of diseased heart, accompanied by dyspeptic complaints, ten drops of diluted prussic acid were prescribed in a five-ounce mixture, of which two table-spoonfuls were taken at first three times a day, and afterward the whole quantity in the course of twenty-four hours. From Dr. Macleod's account, the medicine rendered the patient's journey to the grave much more bearable than it would otherwise have been.]

While, however, a proper course of medicine is pursued, a proper course of diet and regimen must accompany it, or, with the utmost professional skill, we shall make no progress. And hence, to the remarks already made at the outset, that, where the disease has been brought on by a life of indolence, sedentary occupation, or too free indulgence of any kind, the general habit must be changed, and regularity of meals, sleep, and exercise be rigidly insisted upon, it is necessary to add a few other observations to the same purport.

One substantial meal of solid animal food daily is sufficient for a man in full health, engaged in a life of ordinary labour. Yet there are many who, without any labour, are from a long habit obliged to take two or even three. But the habit is bad, and cannot too soon be broken through. It follows, therefore, of necessity, that where the stomach is weak, the toil of digesting one full meal of animal food is the most that should be put upon it. This should take place as nearly as may be to the hour of noon, certainly not later than one or two o'clock, so as to occupy the middle of the wakeful period. The animal food should consist of one dish only; and be confined to such as is lightest of digestion, or as the peculiar state of the stomach may call for; for, in both these respects, there is a considerable difference. Thus shellfish do not always agree with weak stomachs, and will sometimes excite great uneasiness, with pyrectic heat, and even throw out a nettle-rash, or some other cutaneous eruption. Yet where they sit easy and are relished, several of them, as the crab and lobster, are found to neutralize acidity in the stomach more readily and effectually than any other kind of animal food: in effect we should little predict, considering that they give out, on a chymical analysis, a smaller proportion of ammonia than the flesh of quadrupeds, birds, or even amphibials. The food of young animals is less nutritive than that of old, but it is, in general, digested with less irritation. Many writers have arranged the different animals that furnish food in tables, founded upon their supposed degree of nutriment. But they have drawn them up with considerable variations; in some instances apparently according to their own fancy. I have not space to enter into a comparison of these, nor is it necessary. Those who have leisure for such a study may turn to Dr. Darwin's, which is perhaps one of the best, and which they will find in his Zoonomia. Generally speaking, the tenderest food is that of the gallinaceous birds; then that of the ungulated quadrupeds; among which the stag or cervus kind, claims the pre-eminence; and to this succeed the ox, sheep, and hare, in the order in which they are here placed. Yet it should be observed, that the last, though less nutritive than the preceding, is more easily digested than several of them; as it should also, that the flesh of animals in their wild or native state, though less coveted by a pampered palate, offers a more wholesome and digestible aliment, and is more perfectly animalized, than that of animals cooped up and fattened for the table. Below the hare, we may place the webfooted birds that are ordinarily brought to market; and below these, the oyster and lobster tribes, and lastly the numerous genera of fishes. The simpler the cookery of all these the better; for the complicated processes employed to give new forms to the productions of nature, or even to break them down for the use of the stomach, and thus keep the masticatory organs in a state

* Numerous Cases, illustrative of the Efficacy of the Hydrocyanic or Prussic Acid in Affections of the Stomach, &c., 8vo. 1820.

of indolence, injure, instead of promoting, the health of a dyspeptic patient. We have already observed, that the saliva forms an important part in the chymistry of digestion, and it is best applied to the food when first secreted and in the act of mastication; and hence, if this act be prevented or suppressed, the food is without one of its auxiliaries. It is on this account that concentrated jellies, and all mashed dishes, sit more uneasily on a weak stomach than meat taken in a solid form.*

The vegetable nutriment should be such as is least disposed to ferment in the stomach; and hence all kinds of new bread, sweet preserves, confectionary, and pastry, must be sedulously avoided; and the crust of bread, toasted bread, and unleavened biscuits take their place. The farinacea, whether seeds or roots, as rice, wheat, flour, in the form of light and simple pudding, and potatoes, may be allowed in moderation. Water too is the best beverage; but where there is great flatulence, a small portion of brandy may occasionally be added. The only condiments that can be conceded are salt and spices; pickles might be admitted where acids constitute a part of the medical treatment; but they are disposed to provoke a false appetite, and hence to weaken the stomach by overloading it.†

From fixing the principal meal so near the hour of noon, it is clear that we suppose the day to commence at a very different period from the ordinary regulations of fashionable life; in which the bed is rarely quitted before nine or perhaps ten o'clock, after a night of imperfect and feverish sleep, when the languid idler immediately proceeds to a breakfast of tongue, ham, and eggs, in addition to the ordinary materials of his meal, as though he had been already labouring in the field for two hours; and, by means of their combined stimulus, fills his stomach with a load which might indeed do good to the husbandman, but to himself proves nothing more than a mischievous oppression. Yet to this morning toil of the stomach succeeds, at about two o'clock, the ordinary luncheon in a still more solid shape; followed in the evening by a dinner of numerous courses, with high-seasoned condiments and a stimulating change of wines; the real business of this vain and frivolous life perhaps not commencing till the better disciplined peasant has begun his quiet sleep; when, roused by a flow of factitious spirits, and primed for gayety and gallantry, the votary of pleasure, as it is called, sallies forth to join his comrades at the allotted place of rendezvous, and to pass the midnight in hot and crowded ball-rooms, or in orgies of a still more exhausting nature. Of the whole of this career, the only rational part of it is the luncheon a little after mid-day: this may be copied by the invalid before us, as his dinner, but from all the rest we must carefully shut him out. He should quit his bed by six or seven o'clock in the morning in the summer, and by seven or eight in the winter; and, after having risen for an hour, he may partake of a light breakfast of milk, cocoa, sassafras, or any other aromatic or warm-flavoured tea, with toasted bread, the crust of bread, or sea-biscuits, as observed already. The morning may be devoted to such exercises or recreations as may be most agreeable without producing fatigue. To this will succeed the chief meal of the day, upon the plan already laid down; and a light refreshment of the same nature as the breakfast should conclude the daily diet, a few hours before retiring to rest, which should never be later than eleven o'clock. Sea-bathing, or the shower-bath, before breakfast, will considerably add to the means of improvement wherever these advantages can be enjoyed, and particularly when the warmth of the season may give them the character of luxuries.

[The systems of dietetics offered to the world are innumerable, and marvellously contradictory to each other. Some, looking with an evil eye on the refinements of society, would bring us back to the simplicity of savages, and have us live "according to nature." Though when we ask, with the Prince Rasselas, what it is to live according to nature, we are sure to meet with no more satisfactory answer than what was vouchsafed to that noble inquirer. The truth is, however, that our bodies would be as little bettered as our minds, by going back to the state of savages; for it is now ascertained that savages are universally short-lived, and subject to sudden and violent diseases. Population increases slowly among them, and the healthiest and strongest of them, if compared with the average of well-fed civilized Europeans, will be found inferior both in strength and health. Some theorists, again, would have us live solely on animal food, and assert, that the human viscera bear vegetables "only in a grumbling way;" while others would reduce us to the diet of Nebuchadnezzar, and not leave a fleshpot in our kitchens. The different notions on dietetics by no means end here. Some sage doctors will never allow us to fill our stomachs, and some hold that they should never be altogether empty; some reduce the whole mystery of nu-

* Dr. Beaumont (*Exp. and Obs. on the Gastric Juice*, p. 269) has published a table showing the length of time required to digest certain articles of food. He found that boiled rice, pigs' feet, and tripe, soused and boiled, were chymified in an hour; raw eggs, when whipped, boiled, and fried, salmon-trout, and barley soup, in one hour and thirty minutes; roasted turkey, goose, and pig, in two hours; oysters, when raw, in two hours and fifty-five minutes; when roasted, in three hours fifteen minutes; beef-steak, roast beef, broiled and boiled mutton, in three hours; fresh bread, and boiled potatoes, in three hours thirty minutes; potatoes when roasted or baked, in two hours thirty minutes; chickens, ducks roasted or boiled, beef soup, in four hours; and roasted pork in five hours fifteen minutes.—D.

† On the subject of Dietetics, the reader may consult Arbuthnot on the Nature of Aliments, 8vo. Lond. 1731; Fordyce on Digestion, 8vo. Lond. 1791; J. Abernethy on Local Diseases, including Derangements of the Digestive Organs; A. P. W. Philip on Indigestion, 8vo. Lond. 1826; J. A. Paris on Diet, Lond. 1827; J. Johnson on Morbid Sensibility of the Stomach, Lond. 1827.—ED.

trition to a skilful exhibition of successive stimulants, and others to the exclusion of all that can interfere with the balsamic simplicity of the insipid chyle; some hold all fermented substances pernicious, and others think fermentation the best preparative for digestion. But, as the judicious critic, to whom we are indebted for the above reflections, has observed, how is it possible to say what is absolutely the best diet for human beings, when we consider under what an infinite variety of different habits such beings are found to live in health and vigour, and by how many opposite causes their health and vigour are impaired! The same diet that is sanative to one, whose digestion has been weakened by scanty and penurious living, cannot possibly be suitable to another who has suffered from a long course of repletion and excess. The regimen that is most wholesome for youth is not likely to be well fitted for old age; nor can that which answers for the active and laborious, be proper for the studious and sedentary. Nay, your dry and adust subject plainly requires a different regimen from that of the plump and succulent. A lover should not be dieted as a miser; nor a champion of the fancy like a prime singer at the opera. Every man differs from every other in some of the important attributes of age, habit of body, occupation, temperament, and disposition, to which may be added climate; so that all rules of diet must plainly require innumerable modifications to accommodate them to the condition of those classes of persons, even if it were possible to reduce them to certain classes. Besides all this, there are special and apparently capricious varieties of digestive power, which the learned called idiosyncrasy, by which the application even of those vague and variable rules must be constantly frustrated.—(*Edinb. Review*, No. 93, p. 38.) All directions which are rational, must be founded on the circumstances of the individual to whom they are offered; and even then cannot be deemed valid, until they have been confirmed by his particular experience. However, the general instructions given by the author of this work with reference to the diet of dyspeptic persons, may be considered as good and valuable.]

Proper temperature and clothing are also subjects of some importance; but, as we shall have occasion to enlarge upon these, more particularly when treating of PHTHISIS, I shall only observe at present, that the feet and chest should be kept especially warm, and that all extremes of heat and cold should be sedulously avoided; a general glow on the surface, when produced by exercise, will be advantageous, but it should not be carried to the extent of much sensible perspiration, as this might terminate in a debilitating chill. And where the languor is so extreme as to prevent exercise abroad, that of a swing or rocking-horse may be had recourse to at home; or where these cannot be endured, that of general friction, in any of the multiplied forms now in use, and especially friction of the stomach and belly, may be often employed as an advantageous substitute. Every tender mother is well acquainted with the benefit of such an external stimulant to her infant; and when judiciously applied, it may often be rendered so to an adult in cases of great dyspeptic languor and weakness.

[In the valuable paper by Dr. Abercrombie on chronic inflammation and ulceration of the stomach are many judicious observations on dyspepsy. From the facts there related, it appears that the above dangerous affections of the stomach may exist with much diversity of symptoms. These may be severe, and indicative of serious disease, or they may be such as, without very great attention, are likely to be considered as merely dyspeptic. In one case of extensive malignant ulceration of the mucous coat of the stomach, which was under the care of Dr. Chambers, no nausea and sickness existed, and all the symptoms, such as tormina, tenesmus, and frequent discharge of small liquid bloody motions, seemed to indicate disease of the bowels; yet the latter parts were found after death very little affected.—(*Med. Gazette*, vol. i., p. 63.) There may be hardness in the region of the stomach, or nothing may be discoverable by the most attentive examination; and it is in fact extremely difficult to propose any rules by which chronic inflammation of this organ can be distinguished in its earlier stages. It may be suspected, when there is either permanent uneasiness in the region of the stomach, or pain recurring with regularity after meals, and incapable of prevention by attention to diet; when there is tenderness on pressure, especially if the pain and tenderness be always referred to a particular spot of small extent, and distinctly defined; when, along with the symptoms, vomiting occurs at short periods after meals, and after food of the mildest quality; and when, without any urgent or defined symptoms, a patient, with affections of the stomach, becomes progressively weakened and emaciated, in a manner which his symptoms, if considered as merely dyspeptic, could not account for. As Dr. Abercrombie confesses, however, none of these symptoms can be depended upon; most or all of them may exist in connexion with a state of the stomach which is merely dyspeptic; and, under a more serious form, they may end fatally, with every appearance of extensive disease, and yet no morbid change be discovered in the stomach or neighbouring parts. Yet he rightly urges the remembrance of the important practical truth, that symptoms, which at first sight appear to be merely dyspeptic, often depend upon chronic inflammation of the stomach. When there are grounds for this suspicion, he thinks that, though general bleeding is seldom admissible, much benefit may result from topical bleeding, blisters, issues, antimonial ointment, food of the mildest kind and in very small quantity, and the avoidance of stimuli and bodily exertion.—(See *Edinb. Med. and Surg. Journal*, No. 78, p. 12; also, *Path. and Pract. Res. on Diseases of the Stomach*, ed. 2, p. 17.)

The foregoing observations derive much confirmation from the statements of Mr. Annesley.—(*Researches into the Causes, &c. of the Prevalent Diseases of India*, vol. i., 1828, 4to.) In

warm climates, he says inflammation of the mucous membrane of the stomach is a very common form of disease; and it takes place to a greater or less extent in the advanced stages of dyspepsy, the dyspeptic symptoms being truly the effect of gastric inflammation.

Some highly interesting observations on this subject were published by Dr. Armstrong (*Morbid Anatomy of the Bowels, Liver, and Stomach*, p. 42, &c., Lond. 1828); and, if they be correct, a part of the difference in the symptoms, in different cases, may in some degree be explained by the chronic inflammation being sometimes situated in the serous, sometimes in the mucous membrane of the stomach; a topic which will be further noticed in treating of gastritis. There is something forcibly striking in the expression of the countenance and colour of the skin in most organic diseases. Thus, in tubercular disease of the lungs and elsewhere, the cornea becomes more shining, and the conjunctiva more pearly and blanched than natural, with a softness and almost pensiveness of expression; while the face grows more and more sharp, and the skin acquires a much more delicate hue. In scirrhus, the expression is that of more or less solicitude, and the skin commonly has a sallow teint, like that of the pale yellowish willow; whereas in fungus the skin has neither the delicacy attendant on tubercle, nor the sallowness accompanying scirrhus; but it is often of a dull muddled white, almost resembling that of tallow, or putty. Some change about the face and skin will frequently lead the experienced eye at once to suspect deep visceral derangement. Without being led away by first impressions, however, the pathologist will be careful not to confound the ventricular disturbance and sallowish aspect of the sedentary and studious dyspeptic with any organic disease of the stomach; for, though in him the face be "sicklied o'er with the pale cast of thought," yet it is most frequently an indication merely of disorder which admits of cure, and even if continued, may not at all shorten life.*—(*Armstrong*, op. cit., p. 68.)]

GENUS VI.

COLICA.

COLIC. BELLYACHE.

GRIPING PAIN IN THE BOWELS, CHIEFLY ABOUT THE NAVEL, WITH VOMITING AND COSTIVENESS.

THERE are various diseases to which this definition will apply; but which nevertheless differ from each other in several particulars. M. de Sauvages thought these particulars of so much importance as to justify him in advancing each of these complaints to the rank of a distinct genus, under the names of gastrodynia, colica, rhachialgia, and ileus. Dr. Cullen, however, judged differently and more correctly. He regarded their distinctions as of subordinate moment, and in their prominent symptoms traced so close a resemblance as to indicate their being a sort of natural tribe or family; and he has, consequently, simplified them into one genus under the name here adopted of COLICA. In the ramifications of his species, however, he seems a little too diffuse, and he has unnecessarily, and somewhat capriciously, varied a few of the ordinary specific names, as those of ILEUS and RHACHIALGIA, which, for reasons assigned in the volume of Nosology, are here restored. In other respects, the present arrangement does not especially differ from Dr. Cullen's classification. The species that seem fairly entitled to attention are the following:—

1.	Colica Ileus.	Iliac Passion.
2.	—— Rhachialgia.	Colic of Poictou, or Painter's Colic.
3.	—— Cibaria.	Surfeit.
4.	—— Flatulenta.	Wind-Colic.
5.	—— Constipata.	Constipated Colic.
6.	—— Constricta.	Constrictive Colic.

SPECIES I.

COLICA ILEUS.

ILIAC PASSION.

GRIPING PAIN, VOMITING, AND COSTIVENESS, ACCOMPANIED WITH RETRACTION OF THE NAVEL, AND SPASMS OF THE MUSCLES OF THE BELLY.

THE name of Ileus (ἴλεος or εἰλεος, for it was written both ways) is entitled to veneration, as it has descended to us from the earliest Greek writers, who thus denominated it, either from that introsusception or convolution of the intestinal tube which so often accompanies the disease, and which is the direct meaning of the term; or from the ileum, or small intestine, in which the disease is principally or most usually seated. Sauvages, and nearly all the continental writers, continue the term. Dr. Cullen has exchanged it for spasmodica, as an adjunct to colica; but from the comment to the Nosological Synopsis just referred to, it will be seen that he has gained nothing hereby, either in regard to precision or elegance.

The griping pain or bellyache in this species is very acute, and the vomiting is accompanied with a discharge, not only of bile from the duodenum, but of stercoraceous matter from the large intestines, or of injections introduced into the rectum; forcing their way through the strong muscular valve of the colon, which we have already noticed as being formed by a natural prolapse of the ileum, for the purpose of preventing a regurgitation of the feces into this last intestine; and evidently proving a powerful inversion of the peristaltic action through the whole

* The learned author and his able editor, when treating of dyspepsy, might have enlarged with practical utility on the *symptomatic* form of the disease, which arises mainly from causes distinct from the seat and functions of the digestive apparatus. One of the most frequent causes of dyspepsy occurring in females is a deranged function, or a disordered condition of the uterine system. The close connexion between a disturbed state of the uterine economy and a diseased action of the stomach is indeed well known; but this frequent source of dyspeptic evil is too often overlooked or disregarded.—D.

or nearly the whole length of the intestinal canal. While the obstinate costiveness which attends at the same time, pretty clearly indicates a spasmodic constriction, though rarely producing a total occlusion, of that part of the canal where the pain is most violent, often, indeed, extending to other parts, and even to the bile-ducts. And in this last case, even where the feces are discharged by the mouth, they are untinged with bile, while all the symptoms of jaundice supervene.—(*Bartholin, Hist. Anat.*, Cent. v., 62; *Ephem. Nat. Cur.*, Dec. i., Ann. iv. v.) The morbid action is, indeed, not unfrequently so violent as to excite inflammation over a considerable part of the intestine chiefly affected; and consequently to aggravate all the other symptoms.

And hence the disease is presented to us under the two following varieties:—

α Fæcosa. Stercoraceous colic.	The vomiting accompanied with feces or substances injected by the anus.
β Inflammatoria. Inflammatory colic.	Accompanied with symptoms of inflammation.*

The dissection of persons who have died of either of these varieties has shown us, in some cases at least, that one portion of the affected intestine, constringed and lessened in its diameter, has fallen into another portion below it, and thus produced what is called an INTROSUSCEPTION, or involution of its coats. The fact is not difficult to be accounted for; and it will readily explain the cause of the great torture which is often suffered under the influence of this grievous malady. In every case in which the intestinal tube is weakened, there is a very copious extrication of air, producing in many instances a palpable distention of the parietes of the abdomen. In ileus, however, there is also, as we have already observed, in conjunction with this, a strong inversion of the peristaltic action operating from the rectum to the stomach, and forcing back whatever recrement or other materials are co-acervated in any part of the intestines. These, by intermixing with the elastic vapour of the intestinal tube, become very voluminous, and distend it to its utmost range wherever distention can be accomplished. In one or more parts, however, of its entire length, we have also seen that there is a violent spasmodic constriction, through which the distentive force cannot prevail, excepting perhaps by snatches, or during a remission of the spasm The two powers are hence brought into immediate contact; and while the gut is in consequence rigidly contracted above, it is widened almost to bursting below; and, during the struggle which ensues, a part of the imprisoned contents of the expanded intestine is forced upwards, and the collapsed portion of the superior intestine at the same time slides downward at the point of the stricture.*

* In a pathological point of view, the disease resolves itself into three leading modifications, pointed out by that able physician, Dr. Abercrombie:—1. Simple ileus, without any previous disease. 2. Ileus, with previous disease of such a nature, that it acts by deranging the muscular power, without mechanical obstruction. 3. Ileus with mechanical obstruction.—(See Pathol. and Pract. Researches on Diseases of the Stomach, &c., p. 112, ed. 2.) Colic may be distinguished from enteritis by the absence of fever, the pain being generally relieved by pressure, the aspect of the countenance, and the quiet soft pulse. However, in an advanced stage, inflammation may supervene. When the symptoms of colic arise from a hernia, the protrusion will generally lead to its detection. Many diseases, being accompanied by sympathetic vomiting, may be mistaken for colic. Renal or biliary calculi may excite such vomiting; but the former case is characterized by pain in the back, and along the groins to the testicle and thigh, and disorder of the urinary functions; and the latter by a disturbance of the functions of the liver, and pain in the situation of the gall ducts. Besides, in neither of these diseases is there the same obstinate constipation as in colic.—See Whiting and Tweedie, in Cyclop. of Practical Medicine, art. COLIC.—ED.

* It is admitted by Dr. Abercrombie, that, in a fatal case of ileus, we generally find one part of the intestine in the state of distention, and another part empty and collapsed, presenting nearly the form of a cord. However, he considers the doctrine of spasm in this subject entirely gratuitous. The collapsed state of a portion of the bowel, he regards as the natural state of healthy intestine, when empty. On the other hand, he adverts to several facts to prove, that a state of uniform distention, with lividity, may occur as a primary disease of the intestinal canal, without any appearance of obstruction, and without any part of it being in a contracted state. In ileus, the collapsed parts, he says, are commonly found in a healthy condition; the morbid appearances, whether inflammation, lividity, exudation, or gangrene, being almost entirely confined to the distended parts. According to Dr. Abercrombie's views, the causes of ileus are referrible to a primary diminution, or destruction of the muscular power of a portion of the canal, and impediments to its action; the consequence of which is, that a part, at first healthy, becomes impaired. Under the effects of this interruption, primary destruction or diminution of the muscular power of a portion of the intestinal canal seems to take place from the poison of lead, and also in enteritis, where the bowel is distended, without any obstruction in the parts below. Interruption to the action of a portion of the canal, giving rise to distention, and consequent impaired action of the part above, is exemplified in hernia, contraction and adhesion of the intestine, accumulations of fecal or undigested matter in the bowels. However, Dr. Abercrombie admits, that, in some cases, there may be an irregular or morbid contraction of a portion of the canal, and that this may sometimes prove the first step in that chain of derangement of the harmonious action of the canal, which leads to an attack of ileus. At the same time, he regards the doctrine of spasm as in a great measure conjectural.—(Op. cit., p. 149—151.) However, several good practitioners do not follow Dr. Abercrombie on this subject. Thus, Dr. Elliotson conceives that opium may frequently do good by alleviating the spasm.—(Med. Gazette for 1832-3, p. 551.) The occasional vomiting of feculent matter in colic appears to indicate a reversed order of the peristaltic action of the intestines. Drs. Whiting and Tweedie observe, that although Dr. Abercrombie calls in question the spasm of the

In the midst of this spasmodic commotion there is also another extraordinary change which has been sometimes found to take place in the relative positions of different parts of the intestinal tube. For from the urgency of the moving power that works upwards, the natural effect of the gravitating power that works downwards, and the looseness of the convoluted canal itself in many parts, and its tightness from adhesions in others, it has sometimes become twisted into nooses and knots; in which the portion forming an encircling cord or bridle has been drawn so tight as to produce strangulation, and render gangrene inevitable.* In one instance, indeed, the spasmodic action was so extreme, that the bridle not only produced strangulation and gangrene, but cut through all the coats of the intestine on the opposite side to the mesentery, and made an opening of about an inch in length. —(*Med. Observ.*, vol. iv.)

Generally speaking, however, there is more danger in the second variety than in the first: the symptoms, if not early opposed, are more rapid in their progress, and gangrene is produced in a shorter period of time. Yet when an active and well-discriminated course of treatment is pursued, the inflammation is very frequently subdued, and the patient escapes without further injury.

It is a singular fact, that though ileus is no uncommon result both of introsusception and inflammation, it sometimes takes place without either of them, or at least without intestinal pain or other manifest symptoms of inflammation or spasm; for which we have the authority of Stoll (*Ratio Medendi.* viii., 129), Haller (*Comment. Nova. Gotting.*, viii., 1), and Morgagni.† Even where inflammation exists, it is not difficult to distinguish the disease from enteritis, by the spasmodic contraction of the abdominal muscles that accompanies it, the diminution of pain which ensues upon pressing the abdomen,‡ and the small degree of fever which is present, compared with that by which enteritis is usually characterized.

Both varieties of ileus are apt to run into each other, and the disease assumes the first or the second form from the patient's idiosyncrasy, the peculiar condition of the organs affected at the time of the onset, the temperament of the season, or some other adventitious circumstance. The causes, therefore, for the most part, are alike, and very numerous. The more common are, acrid, cold, or indigestible esculents; cold beverages on a heated stomach; catching cold in the feet or abdomen; exposure to wet during the flow of the catamenia; unalimentary substances swallowed through bravado or by mistake, as knives, metallic money, or pieces of glass, plum, cherry, or other fruit stones; an excessive flow of bile probably of bad quality; worms; drastic purgatives in an over-dose, as scammony, black hellebore, and colocynth; calculous or other balls congested in the intestines and obstructing their passage, as scybala, bezoards, biliary calculi, and indurated feces; violent passions, or other emotions of the mind, as extreme rage or terror; introsusception, a diminished capacity of the intestinal canal from scirrhus or cancerous tumours, from internal hernia,* from an ossification, callosity, stricture, or coalescence of its internal tunic, [or from the difficulty with which the contents of the bowels sometimes pass that portion of the canal which lies near the situation of a previous artificial anus.†] It is also at times a consequence of transferred gout or rheumatism.

In the treatment of iliac passion, whenever there is inflammation, or a decided tendency towards it, evidenced by shivering or a full pulse, blood should be taken freely, and even repeatedly, from the arm, whether the patient be of a strong, robust, or of a delicate and weakly constitution. It is a practice, indeed, recommended generally by many writers in the commencement of the disease, even where no inflammatory action exists, with a view of relaxing the spasmodic constriction; but, in these cases, it is not absolutely called for, and, where the habit is weakly, is likely to produce more harm than good.‡

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muscular fibres of the intestines, he cannot be said to have proved this point; he has, however, made it clear, that in many instances where colic has been supposed to arise from spasmodic contraction of some part of the bowels, it ought to have been referred to another cause.—Cyclop. of Practical Medicine, art. COLIC.—ED.

* Mém. de l'Acad. Royale, xxiii. par M. de la Peyronie. Also several cases in Abercrombie's Pathol. and Pract. Researches on Diseases of the Stomach, p. 119—125, 2d edit.—ED.

† De Sedibus, &c. xxxv., 19, 21, 23. In one fatal case, noticed by Dr. Abercrombie, the only changes found on dissection were, a softened state of a part of the right lobe of the liver, and a great and uniform distention of the small intestine, without any appearance of inflammation.—ED.

‡ Some examples on record do not correspond to this account; thus, in one case related by Dr. Abercrombie, *the pain was increased by pressure* at the very commencement of the attack, even before any inflammation can be supposed to have existed; and, after death, merely a superficial blush of vivid redness was noticed, without any appearance of exudation.—See Pathol. and Practical Researches on Diseases of the Stomach, &c., p. 114, ed. 2.—ED.

* On the autopsy of a case of ileus terminating in enteritis, Dr. Francis observed a remarkable deviation from the normal structure; a portion of intestine extended from the ileum to the umbilicus, forming a diverticulum of the ileum. For the details of this curious case, with a plate, see *Am. Med. and Phil. Reg.* vol. i., p. 38.—D.

† See Abercrombie, op. cit., p. 126.—ED.

‡ Ileus sometimes terminates in inflammation: this is one important reason for bleeding, when not forbidden by the patient's age, or the state of his constitution. Besides this obvious fact, Dr. Abercrombie believes there is a modification of the disease, depending upon inflammation limited to the muscular coat; here also blood-letting seems to him an important remedy; and the fact is familiar to every practical man, that the relief is often so immediate, that there is no time to raise the patient out of bed, or scarcely to tie up the arm, before complete evacuation takes place.—(Abercrombie, op. cit., p. 159.) The best modern

The two next points to be aimed at are, a removal of the griping or spasmodic pain, and a restoration of the intestines, from a state of inverted action, to their proper peristaltic motion; and hereby a resolution of the costiveness.

For the first, humid heat in the form of a warm bath, warm fomentations, and warm and copious clysters, afford a rational chance of success. The last should be rendered emollient by a solution of oils, and moderately loaded with purgatives, so that both intentions of cure may be carried forward at the same time. In combination with these, opium may also be tried, and various other narcotics; and especially the extract of hyoscyamus, which in many instances evinces an aperient as well as narcotic power. [The introduction of tobacco-smoke, or the infusion of the plant into the rectum, is frequently of service. Dr. Abercrombie regards the tobacco injection as the remedy of most general utility in all forms and stages of ileus: fifteen grains are to be infused for ten minutes in six ounces of boiling water; and an hour after the injection of this quantity, if no effect has been produced, twenty grains may be infused, and their power tried; and so on, until slight giddiness and muscular relaxation show that the peculiar action of this narcotic is taking place. If the case should not now yield speedily, Dr. Abercrombie recommends the clyster to be repeated every hour, or every two hours. With this means he associates full doses of mild purgatives, such as aloes and hyoscyamus, every hour or two. Also, if the patient be of a full habit, the pulse be rising, and a fixed pain or tenderness be complained of in any part of the abdomen, Dr. Abercrombie has recourse to one or two bleedings.—(*Researches on Diseases of the Stomach*, &c., p. 159, ed. 2.)] If the opium be employed in the form of a tincture, the dose should be from a hundred to a hundred and twenty drops in an injection of four ounces of warm olive-oil. If hyoscyamus be had recourse to, we may safely use either the seeds or the extract; about four or five grains of the former, and ten of the latter, may be added to each injection. Clysters of a strong decoction of poppy-heads have also frequently been found highly beneficial.* And to these should succeed the application of stimulants to the belly, as ammonia, or blisters. Sir John Pringle speaks highly of the latter, and not without reason; for, if made sufficiently large to be active, they often succeed, not only in quieting the spasm, but in obtaining evacuations, after injections, purgatives by the mouth, fomentations, and opiates have been tried without effect.

Purgatives for the second intention, and combined with antispasmodics, should, in like manner, be attempted by the mouth; though the vomiting is sometimes so incessant that we can get little or nothing to stay on the stomach. But the attempt must be made, and steadily persevered in. Calomel, in free doses of about four grains to a dose, will usually be found the best aperient medicine. It occupies the smallest space, and in the form of a pill, has the fairest chance of being retained. If repeatedly rejected,* it must be combined with opium, which nevertheless has a tendency to retard its action; but as the opium may mitigate the spasm and diminish the pain, it will commonly be found a useful adjunct, and a grain or two of it may be given every six hours. Calomel, however, though sure, is slow in its operation; and should hence, where the stomach will bear it, be united with some other and brisker aperient. Of these the neutral salts seem to answer best; but if they cannot be retained, we must exchange them for tartrate of potassa, which is less likely to be thrown back. It is seldom that the drastic purgatives can be recommended; because, if they do not succeed, they are apt to excite inflammation where it does not exist, and to increase it where it does.†

[One modification of ileus yields to a full dose of opium sooner than to any other treatment. Such case seems to Dr. Abercrombie (op. cit. p. 160) to be chiefly characterized by paroxysms of violent tormina, and, if these are accompanied by frequency of pulse, and fixed pain or tenderness, he deems a free bleeding, followed by an opiate, a successful practice. At the same time, he expresses a preference to the treatment with tobacco injections, as generally safer than the employment of opiates.]

The relief derived from the symptom of vomiting has led some practitioners to prescribe emetics; but the benefit hence obtained is very transient. I do not mean to say that they have never been serviceable; but they cannot be relied upon except in special cases, and have oftentimes aggravated the spasm.

Dr. Cullen, on the advice of De Haen, recommends a stream of warm water to be thrown forcibly and with a proper syringe into the rectum, so that it may play like water from an engine upon the constricted portion of the intestine; and declares that he has found this remedy to be one of the most effectual.‡ When

physicians certainly seem to be more in favour of venesection than Dr. Good.—Ed.

* Colic may arise from hardened feces in the rectum, and hence another reason, very properly insisted upon by Dr. Elliotson, for the invariable use of a clyster, who prefers one composed of three ounces of oil of turpentine, blended with a pint of gruel or other fluid. Sometimes the removal of indurated feces from the bowel with the handle of a spoon becomes necessary.—See Lect. in Med. Gazette, for 1832-3, p. 551.—Ed.

* In cases where purgatives have been rejected by vomiting, a small portion of the cuticle may be removed by a blister; after which, the application of one or two drops of croton-oil to the part, will commonly purge.—D.

† Dr. Elliotson does not seem to be intimidated by this doctrine; for, after giving scruple doses of calomel, and finding that this medicine remains in the stomach, he prescribes a strong dose of castor or croton-oil, and Epsom salts. In one severe case, he gave with success a drop of croton-oil every hour or half hour, till the desired effect had been produced.—Op. et vol. cit., p. 550.—Ed.

‡ In the Glasgow Medical Journal is a case, in which the inflation of the intestines with common air gave relief.—Ed.

the ordinary means, and particularly those of warm injections and the warm bath fail, some practitioners have been courageous enough to try cold applications both external and internal. Sir George Baker tells us, that a physician of credit informed him he had once prescribed the cold bath with success. And Citois affirms, that, in several species of colic, this was his constant practice, even in the midst of winter, and calls upon all his fellow-citizens to attest, that most of his patients thus treated had been restored to health.* Saccassani relates (*Epist v. Haller, Bibl. Med., Pr.* iii., p. 601) the case of a person instantly cured by drinking a large draught of cold water. Zacutus Lusitanus narrates the history of a patient who speedily got well by being rolled in snow.—(*Prax. Adm.*, lib. ii., obs. 23.) But these are extreme instances; and, notwithstanding an occasional success, the practice is not to be depended on. It will prove most effectual where the colic is accompanied with, or produced by, hysteria. While, on the contrary, where it has been occasioned by too violent doses of drastic purgatives, warm stimulants, as the oil of turpentine, and even brandy (*Clossius*, obs. 27), have been taken with great advantage.

Dr. Percival, Dr. Warren, and various other writers, upon their authority, advise that the antispasmodic plan, whether by the stomach or the rectum, or both, should take the lead, and the purgative plan follow. This will always be found the proper order in attacking the painter's colic: but we should lose much important time, and often allow the inflammatory symptoms to get fatally ahead, if we were to adopt this as a general rule in iliac passion; in which the symptoms, if not more dangerous, are more urgent, and demand a more rapid march of treatment. [After the explanation given of the numerous and very different circumstances exciting or accompanying ileus, it requires but a slight effort of the understanding to know that the treatment ought not to be conducted in any particular way in every example of the disorder. Hence Dr. Abercrombie points out three varieties of ileus: one case, characterized by obstinate costiveness, distention of the abdomen, and considerable general uneasiness, but without tenderness, or much acute suffering. Another case, where the same symptoms are combined with fixed pain and tenderness, referred to a defined space on some part of the abdomen. A third case with violent attacks of tormina, occurring in paroxysms, like the strong impulse downwards from the action of a drastic purgative—the action proceeding to a certain point, there stopping, and becoming inverted, followed by vomiting, the vomiting often feculent. Dr. Abercrombie thinks that these distinctions seem to denote the propriety of differences of treatment, according as the symptoms may indicate a deficient action in the canal, or one in which there is violent action limited to a certain part of it, though ineffectual for overcoming a derangement which exists in a lower portion of the tube. The practical application of the distinction refers chiefly to the use of purgatives in ileus. "There are some cases," says Dr. Abercrombie (op. cit. p. 158), "which yield at first to a powerful purgative; and others, in which an active purgative is highly and decidedly injurious. A large dose of calomel will frequently settle the stomach and move the bowels; but upon the whole, I think the best practice in general is the repetition, at short intervals, of moderate doses of mild medicine, such as aloes combined with hyoscyamus. The peculiar and intricate character of the disease appears very remarkable from the fact, familiar to every practical man, that there are cases which yield to a full dose of opium, after the most active purgatives have been tried in vain."]*

SPECIES II.

COLICA RHACHIALGIA.

COLIC OF POICTOU. PAINTER'S COLIC. DEVONSHIRE COLIC.

THE PAIN AT FIRST DULL AND REMITTING; BUT PROGRESSIVELY GROWING MORE VIOLENT AND CONTINUED: EXTENDING TO THE BACK AND ARMS, AND AT LAST PRODUCING PARALYSIS.

FROM the pains striking through to the back, Astruc first distinguished this species by the name of RHACHIALGIA (ῥαχιαλγία), literally, "back-bone-ache, or spine-ache;" and as the term is highly expressive, and has been continued by most of the continental writers, it is retained as a specific name in the arrangement before us, notwithstanding that it has been dropped, or varied, or exchanged for some other, by several writers of our own country.†

The pain is most commonly seated, from the beginning to the end of the attack, at the pit of the stomach. It is at first dull, but gradually grows more severe; and, as it increases, extends upwards to the arms, and downwards to the navel, back, loins, rectum, and bladder;

* F. Citesii Opuscula Medica, p. 215. "When every thing has failed, I have known this affection of the bowels overcome by taking the patient out of bed, and dashing two or three pails of cold water upon the abdomen."—(Professor Elliotson's Lectures, Med. Gaz., 1832-3, p. 551.) Dr. Abercrombie has repeatedly tried the method of raising the patient into a standing posture, and dashing cold water about his legs; but no benefit resulted from it.—(Pathol. and Practical Researches on Diseases of the Stomach, &c., p. 160, ed. 2.)—ED.

* Dr. Eberle mentions (*Practice of Medicine*, vol. ii., p. 338) a case of ileus, in which several inches of the intestine sloughed off, and passed away by stool. New adhesions formed, and the patient recovered. In the same work we find a reference to a case, where, "other remedies failing, the Cæsarean operation was performed, the invaginated intestine drawn out, and a perfect cure obtained."—D.

† According to Dr. Monro, the pathognomonic symptoms of painter's colic are, the acute twisting pain about the navel, not increased by pressure; the dragging inwards and hard feel of the abdominal parietes; tenesmus; and obstinate costiveness.—Morb. Anat. of Human Gullet, &c., p. 246.—ED.

and frequently to the thighs and legs. From the navel it sometimes shoots with so much violence to each side, that the patient feels, and so expresses himself, as if some person were cutting him in two. Almost all the external muscles are rendered sore by the great violence of the pain, as though they had been affected with rheumatism, and can scarcely bear the weight of the bedclothes, or the slightest touch of a finger. Sometimes, however, the seat of pain alternates between the stomach, which nevertheless, as just observed, it never entirely quits, and the external muscles: it is violent in the stomach, while the lower bowels and the external muscles are at ease; or it nearly quits its hold on the stomach and lower bowels, and rages through the external muscles. Sickness is an early symptom, as well as costiveness; and as the pain in the stomach increases, the sickness increases also; even on the second day from the attack, the retchings are violent, and the discharge thrown up consists of acrid slime and porraceous bile. A momentary relief is hereby usually obtained, and the patient flatters himself that he is about to recover. Too soon, however, does he find himself disappointed: as long as the pain continues, the same morbid matter is secreted, and thrown into the stomach; and the retchings return with perhaps accumulated violence: or, if they do not, their place is supplied with bitter eructations and hiccoughs. The pulse, notwithstanding the severity of the sufferings, is little affected at first, and for several days continues as quiet as in health. After the fourth or fifth day, however, it sometimes becomes quicker, but not always: and it may admit of a question, whether the acceleration be not even at this period rather the effect of the medicines taken to procure relief, than of the disease itself.—(*Dr. Warren, Med. Trans.*, vol. ii., p. 72.) [The skin, though generally cold and damp, is occasionally rather hot; but there appears to be no tendency to inflammation.] The urine varies so much in different individuals that no stress can be laid upon it. [In some cases, the sphincter muscles of the bladder and anus are so contracted, that the urine and feces cannot be voided, and a clyster-pipe is difficult of introduction.—(*Monro*, op. cit. p. 246.) Towards the close of the disease, there is generally a pain round the edges of the feet and at the extremities of the toes, which are often red and swollen, and to appearance gouty. Relieving sweats break forth, sometimes accompanied with an efflorescence. About the same time, a griping of a different kind from what has hitherto been endured, and which is more easily bearable, takes place, attended with a disposition to go to stool; and after large discharges of various kinds of excrement, frequently of scybala or hard lumps, in shape resembling sheep's dung, together with black and dirt-coloured slime, occasionally mixed with blood, the patient is perfectly relieved. After several attacks of this disease, a paralysis commonly affects the fingers, or the whole hand and fore-arm, so that the former become contracted, and the hand, when the arm is extended horizontally, hangs at a right angle to the arm, the extensor muscles being in both cases more paralyzed than the flexors. The palsied limb shrinks very much; and the muscles lose not only their natural size, but also their natural structure, being converted into a suety substance (*Monro*, op. cit., p. 247), or a soft pulp.*

Some writers represent the bowels as exhibiting after death a remarkable diminution in their diameter; some have met with invaginations; and others have found the bowels red and more or less injected. All these appearances seem, however, to be accidental, and not to constitute any essential part of the disease; for, in the first place, they may exist without being attended with symptoms of colic; and, in the second, persons die of the latter disease, and yet when their bodies are examined, no morbid appearances of the above description can be traced. M. Andral has published the details of several cases, in which no vestiges of disease could be detected in the alimentary canal after death, and similar facts are recorded by M. Louis. Neither could M. Andral find any defect in the brain and spinal marrow; and yet serious degrees of palsy had taken place.†]

In a mild degree, and under the best therapeutic plan, the disease can seldom be removed in less than five or six days; but if it be violent, neglected, or ill-treated, it will continue for weeks, or even months, with now and then a truce for a few days; and will terminate in the above peculiar sort of palsy of the upper extremities; or in death, preceded by deafness, blindness, delirium, or epileptic fits.

The remote cause appears in almost every instance to be lead introduced into the system, either by the stomach, the lungs, or the skin; and hence the disease is found most frequently in those countries, and under those circumstances, in which this metal is most freely used or most readily dissolved. In the neighbourhood of smelting furnaces, pigs, poultry, and other animals evince the same complaint. Thus, too,

* Dehaen gives a remarkable instance of a softening of the muscles in a person who was attacked by paralysis of the upper extremities, in consequence of colica rhachialgia. The muscles of the limbs, though capable of slight contraction, were converted into a substance as soft as pulp. After the removal of the paralysis, they recovered their usual consistence. Barthez mentions a case in which, under similar circumstances, the two deltoid muscles were softened in the same extraordinary degree; but returned to their natural condition after the paralysis had been cured. It is well known to pathologists, that, when the muscles of animal life have been long in a state of inactivity, they always grow pale, and lose their proper firmness.—See Andral, Anat. Pathol., t. i., p. 220.—Ed.

† See Andral, Anat. Pathol., t. ii., p. 210. "If," says this distinguished pathologist, "there be one fact established in medicine, it is, that the lead colic is not an inflammation." He considers it to be a neurosis, in which the spinal marrow and abdominal plexus of the great sympathetic nerve are affected. He refers the constipation either to an annihilation of the contractile motion of the intestines, or a suspension of their mucous secretion.—(Clinique Méd., t. iv., p. 506.)—Ed.

in Poictou and Devonshire, in which lead was formerly employed to destroy the acidity of the weak wines and ciders for which these provinces are celebrated, it was at one time so common as to obtain the name of Devonshire colic, and colic of Poictou. And hence house-painters, whose occupation leads them to a constant use of lead, and who are often too little attentive to personal cleanliness, are to the present hour so frequently affected by it, as to give it the still more general name of painter's colic. Plumbers, potters, glaziers, workers in glass, gilders, chymists, miners, and printers, are, in like manner, exposed to its attack, from the large quantity of lead contained in the materials they are continually handling. I attended some years ago a printer, who had several times been afflicted with this disease, but had fortunately recovered from every attack, though each return proved severer than the preceding. The cause had never been suspected till I pointed it out to him, by inquiring whether, after leaving the printing-office, he was careful to wash his hands before he sat down to his meals; to which he replied, that he had never been put upon his guard on this subject, and had, therefore, never attended to it. I rigidly enforced upon him the necessity of doing so, and he continued for six or seven years without the slightest return. At this period he again grew careless and confident; he again suffered, and lost his life.*

[The power of lead to excite colic and paralysis has been long known, these effects having been frequently traced to the accidental or designed use of the metal as medicine, or in the food and drink. During the sixteenth and seventeenth centuries, when preparations of lead used to be given in large doses medicinally, the colica pictonum and paralysis, in their severest forms, appear to have been very frequent. Nevertheless, it was not until the investigations of Sir George Baker were published, that the poison of lead was suspected even to be the common, much less the exclusive cause of colica pictonum. In countries where the disease was endemic, it was attributed to a free use of the sub-acid wines, or other acidulous liquors, peculiar to the respective districts with which, in fact, it was very obviously connected. In the West Indies, the endemic colic, called the dry bellyache, is observed to be the consequence of drinking freely of newly-distilled rum: and this liquor is therefore universally considered as the cause of the disease. Andral remarks, that an assemblage of symptoms, corresponding in every respect to colica pictonum, may arise from sudden and continual changes of temperature, as happens at Madrid; and also from causes which primarily affect the nervous system. "The origin of some other cases," he says, "baffles investigation. The positive reference of this form of colic in every instance to the action of lead, seems therefore not quite warranted."*

Lead, under some modification or another, is now considered to be the real cause of this species of colic. The cider of Devonshire produced the disorder much more frequently and extensively than that of other counties, as of Herefordshire; and the wines of some districts on the continent excited the disease, when similar wines of other districts did not. Sir George Baker ascertained, that a small quantity of lead was employed in several of the mills, in which the apples were bruised for the manufacture of cider, to fasten the iron cranks which connected the stone-work. It is well known, too, that in several countries on the continent, the practice of sweetening the wines with litharge, and other preparations of lead, was very common, and that, in these districts, the colic was particularly prevalent. Dr. Moseley was cautioned by Dr. Menghin, of Inspruck, to avoid all sweet wines whatsoever, but particularly the common tavern wines, upon the road in the Tyrol and in Italy. He never deviated from this advice but once, at Viterbo, and then he paid dearly for his indiscretion.—(*Treatise on Tropical Diseases*, p. 527.) Colica pictonum is very prevalent in this metropolis and other large towns; yet Dr. Bateman never saw an instance which was not decidedly traced to the operation of lead. A great proportion of house-painters and plumbers, he observes, have the disease at some period of their lives; and, in particular constitutions, a very minute quantity of lead will bring it on. Dr. Fothergill has recorded several cases, in which it took place in persons who painted in water-colours, and were in the habit of pointing the pencil in their mouths. In addition to these facts, it deserves notice that, in many specimens of cider, which were analyzed by Sir G. Baker, a small portion of lead was detected. And in the new rum of the West Indies, which excited the colic throughout several regiments, while others were totally free from it, Dr. Hunter discovered by analysis the presence of lead. After a time, the lead appears to be deposited, and then the rum loses its noxious quality.†]

The question was next started, and it has been started again in our own times, whether pure water, as well as acid wine, be not capable of dissolving lead in a metallic state; and, consequently, whether the community be not daily running a great risk of being poisoned by employing this metal in pumps and reservoirs? The public mind was for a long time agitated by this discussion, and Dr. Percival thought it right to institute a variety of nice experiments to allay the general apprehension, by showing that pure water is not in any respect a solvent of

* The distinguished Franklin, originally a printer, first pointed out this affection (*Phil. Works*, vol. iii., p. 399) as occasionally occurring among these *men of letters*. It would be well for this valuable class of operatives to pay due regard to the cautions in the text. Cases of colica rhachialgia and of partial paralysis can sometimes be traced to no other cause.—D

* See Andral, Anat. Pathol., t. ii., p. 210; and a Memoir by M. Pascal, in Journ. de Méd. Militaire.

† See Med. Trans., vol. iii.; and Med. Obs. and Inq., vol. v.; and art. Colica, in Rees's Cyclopædia.

metallic lead.—(*Obs. and Exp. on Lead*, 1767.) Yet it was a course hardly necessary, since the daily use of lead in water-cisterns, by upwards of a million of inhabitants in this metropolis, without any inconvenience whatever, was then, and still continues to be, the most decisive and satisfactory proof that can be afforded of the insolubility of metallic lead in rain or river-water. Even saturnine lotions applied to the surface of the body have rarely, if ever, been found deleterious, although these also were at one time suspected of being highly mischievous. They may perhaps prove so in a few singular idiosyncrasies, but they do not affect mankind in general.

Lead, however, so minutely divided as to impregnate the atmosphere with its effluvium, has frequently laid a foundation for the disease. But whether any preparation under the form of cosmetics has proved injurious, I cannot undertake to say. The disease has certainly been produced by sleeping in newly-painted rooms, of which a striking instance occurred a few years ago to myself. The patient was a surgeon of highly distinguished character in this metropolis. When I saw him, at his particular request, he had been ill for a fortnight; and, the cause not having been suspected, his complaint was conceived to be obscure and anomalous. The symptoms, as they struck me, were evidently those of rhachialgia from lead; and upon pointing out to him my view of the case, I found that, about a month antecedently, he had sent the whole of his family into the country, as his house was about to undergo a thorough repair in painting, while he himself remained at home, and slept there. The cause was admitted and acted upon, but the disease had gained too much ground, and was immoveable; his spirits became deeply dejected, and he fell a sacrifice in about two months from the attack.

In the Medico-Chirurgical Transactions is a case communicated by Dr. Badeley, in which the patient, a domestic in his own house, lost her speech and became paralytic from being only six hours in a newly-painted room, but quickly recovered from both upon being removed;* evidently proving the deleterious influence of lead in a state of vapour; and, at the same time, that, in different constitutions, it will show its effects upon different organs or in a different manner.

Sir George Baker asserts, that he has known the disease originate from minute corpuscles thrown off from the clothes which have been worn by plumbers while at work.—(*Essay on the Endemial Colic in Devonshire*, 1762.) And in corroboration of this remark, Dr. Reynolds observed, when he was physician to St. Thomas's Hospital, that the colic of all the workers in lead frequently returned, under any management whatever, while they were allowed to wear the clothes in which they had been accustomed to labour: on which account such clothes were never suffered to lie on the patient's bed. Sentin (*Memorab.*, p. 114) was a witness of the same effect from hanging up labourers' wallets, filled with food for the day, in places impregnated with the vapours of lead. And the present author has occasionally met with other instances of the disease from an habitual residence in close damp rooms, filled with *newly-printed* or *coloured* paper: for the emanation of flake-white, which usually enters into the colour, seems to have the same power of affecting or being affected by the surrounding atmosphere, as that of lead in a finely attenuated metallic state.—(*Med. Trans.*, vol. iii., p. 420.)

I have said that pure water does not act upon lead in a metallic form,* but while we see lead thus easily disintegrated, and reduced to an oxyde or a carbonate by acids existing in the atmosphere, or even by the atmosphere itself, we may readily conceive that aërated waters are capable of decomposing it in a slight degree, and of forming oxydes or salts that may be injurious to the health. And hence, where lead is required in the form of reservoirs for waters of this kind, or for culinary vessels, it should, by all means, be united with tin in equal proportions, as recommended by M. Prout (*Annales de Chimie*, tom. lvii., p. 84), or with a slight surplus of the latter, as proposed by M. Vauquelin.—(*Id.*, xxxii., p. 243.) For first, tin is a harmless metal, as well in its salts and oxydes as in its reguline state, at least in any quantity in which we can conceive it possible to be swallowed by mistake. And, next, as it is more readily oxydable, and has a closer affinity for all the acids than lead, when united with the latter it must completely draw away all the acid it can come in contact with, and detach every atom of oxygen which might even previously have been united with the lead.

The paralytic effect produced by the action of lead is one of the most formidable symptoms to be encountered in the therapeutic process: in laying down which, our first efforts should not be different from those in the preceding species, excepting that, in an attempt to remove the spasmodic pain, opiates may be allowed to precede the use of purgatives. [Colica rhachialgia is attended with obstinate costiveness, and, therefore, one would be inclined to have recourse at once to the most active purgatives. The best physicians have differed, however, respecting the propriety of beginning with cathartics. Sir George Baker directs purgatives; Dr. Darwin and Dr. Warren opiates.—(*Zoonomia*, vol. ii., *and Med. Trans.*, vol. ii.) Dr. Bateman was also satisfied that, whenever colic could be decidedly traced to the operation of lead, the most effectual treatment is the administration of a large dose of opium, and repeated at short intervals until the pain and spasmodic stricture are relieved, after which the bowels may in general be easily opened, and the cure completed by tonics and cordials.—(Art. Colica, *Rees's Cy-*

* Vol. ix., p. 238. See also Seguin, Annales de Chimie, lxxxviii., 263.

* Some late chymical analyses have shown the presence of a minute portion of lead in what is termed pure spring-water, when it has been retained for some time in leaden pipes or vessels.—D.

clopædia.) One of the latest and best writers on the subject, Dr. Pemberton, has recommended a union of castor-oil and laudanum. Dr. Cheyne has generally succeeded in relieving colica pictonum by following Sir George Baker's practice; yet occasionally he has found it necessary to give opium, and that too in large doses, particularly when obstinate vomiting occurred. Dr. Pemberton (*On Diseases of the Abdominal Viscera*) states that in some examples, opium itself will act as a purgative, as he supposes, "by resolving the spasmodic affection of the colon, by which the feces are locked up between its circular bands." And one critical writer recommends a large dose of opium with the same view, as after its exhibition the difficulty of procuring stools, he says, is not great.—(*Edin. Med. and Surg. Journ.*, vol. iii., p. 72.) With Dr. Cheyne, however, a doubt may be entertained, whether the costiveness be owing to spasm.* "From the tormina we know that there is excitement in some part of the canal; from the vomiting we infer inverted peristaltic action; but from the obstruction we can infer no more than torpor of a particular part, and, judging from the symptoms which afterward occur, this torpor would appear to be paralytic." This view of the state of the canal enables us, without the aid of spasm, as Dr. Cheyne conceives, to understand how benefit results from opium. His plan is, to administer purgatives in the slighter cases, and opium with purgatives and stimulating clysters in the more severe ones.† Fomentations to the abdomen, the warm bath, and emollient injections containing laudanum, are useful means; and venesection (See *Gregory's Elements of Physic*, p. 513, 2d, edit.), if signs of inflammation of any of the abdominal viscera be present.‡ In cases produced by the vapour of lead, Orfila says (*Toxicologie*, tom. i., p. 658), the antiphlogistic treatment should be abandoned.] The paralytic effect has been attempted to be subdued by the counteraction of other metals introduced into the system for this purpose: and especially mercury and silver. Both have, indeed, been given from the commencement of the attack by many practitioners; and, as themselves relate, with great success. Dr. Warren and Dr. Biss were in the habit of persevering in the mercurial process till they obtained a salivation; and assert that they found the dull griping pain give way as soon as this was accomplished. The silver employed in rhachialgia has usually been in the form of its nitrate, or lunar caustic, to the amount of four or five grains in the course of the day. Dr. Roberts has published two cases of a cure obtained by this remedy; the one, that of a young, the other of an old man. The cases were both of considerable standing, and the joints of the wrists were weak almost to paralysis. Even this symptom, however, yielded by degrees. The salt was given from three to five grains at a dose, three times a day, in the form of pills: and in the last case five grains every six hours. It has the advantage of being a laxative as well as an antispasmodic: so much so, that a small quantity of opium was on this account added to the nitrate when given in its most frequent doses.—(*Med. Trans.*, vol. v., art. v.)

In treating of passive hemorrhage, we shall have occasion to observe, that whatever deleterious property the acetate of lead may possess, it is entirely removed by a judicious mixture of opium with it, so as in this state of union to become a most valuable styptic. It is possible that, under the form of an acetate, lead may be less injurious than under some others, for it has not unfrequently been given alone in the same complaint without any rhachialgic pains, where the bowels have been kept in a soluble state. But with opium every mischief seems effectually to be guarded against: and the beneficial influence of opium upon lead in this case should induce us to employ it, and that very freely, as an antidote in every case, and especially in the disease before us; and to counteract its constringency by a union with calomel. This rational practice, which has been pursued in our own country by several physicians, ever since Dr. Reynolds first called the attention of the profession to the corrective power of opium, when combined with lead in the case of hemorrhage, has now for many years been also tried with success in various parts of the continent. In France, the dose of opium has been usually only a grain or a grain and a half every night; but in Spain, as we learn from the memoirs of the *Real Academia Medica de Madrid*, a much bolder and more satisfactory employment of this medicine has been exhibited by a physician of distinguished judgment, Don Ignacio de Luzuriaga, who prescribed a grain of opium every three hours; and it will often be found necessary to augment this quantity.—(*Las Memorias de la Real Academia*, &c., Madrid, 1796.)

As the sulphate of lead is a compound insoluble in the stomach, and consequently altogether inert, M. Orfila ingeniously attempted to reduce the acetate and other preparations of this metal to the form of a sulphate, by giving large quantities of sulphate of magnesia; and he thinks he hereby succeeded in effecting a decomposition in the stomach of two dogs, upon which he made experiments to ascertain this

* Dr. Cheyne's opinion on this point is corroborated by the statement of Professor Andral:—"The bowels," says he, "have been alleged to be strongly contracted in the lead colic, and their cavity much smaller than in the natural state; but my own observations enable me to declare, that nothing is more incorrect than this assertion."—Anat. Pathol., t. ii., p. 119.—Ed.

† Op. cit., vol. iv., p. 314. Dr. Elliotson does not particularly object to opium, provided it be briskly followed up by purgatives; yet he thinks that the latter answer equally well by themselves, without bringing on subsequent costiveness, which opium is likely to do. He begins with a large dose of calomel (one scruple), and then gives half an ounce of castor-oil every two hours, until motions have been procured.—Ed.

‡ In one of the earliest tracts which American medical literature can boast of, Dr. Cadwallader, of Philadelphia, about the year 1740, recommended mild cathartics and opiates for the cure of this disorder, instead of the then popular practice by drastics of quicksilver.—D

point, and in producing sulphate of lead in their stead. The experiments, however, proved fatal in both instances, though some portion of sulphate of lead seems to have been formed, and the death of the second dog to have been retarded. As the want of complete success may be ascribed to the want of a sufficiency of sulphuric acid in the re-agent employed, it would be better to try the experiment for the future, by giving the purgative salt in infusion of roses, or any other liquid adequately charged with the acid to answer the purpose; or by a free exhibition of the acid in a diluted state alone.

[Alum was at one time a popular remedy for painter's colic, but it has not maintained its ground; a fact rather against the efficacy of the sulphate of magnesia, as the merits of both depend upon the same chymical principle. Where, however, the colic arises from the presence of recently swallowed acetate of lead in the alimentary canal, and not from absorption by the skin, the method suggested by Orfila, with Dr. Good's improvement of it, seems the most promising of any of the plans hitherto recommended for counteracting the poison of lead. In confirmation of this observation, the editor begs leave to remind the reader of a statement made by Dr. Paris (*Pharmacol.*, vol i., p. 338, 6th edit.), namely, that he has found, in the treatment of hœmoptysis, the effects of the acetate of lead quite invalidated by combination with alum, or by being prescribed with acidulated infusion of roses, or with small doses of sulphate of magnesia.]

The best purgatives, where the costiveness is severe, are those impregnated with the principle of camphire, as the essential oil of turpentine; and where these fail, the oil of croton in doses of one or two drops in the form of pills. [Dr. Elliotson sometimes has recourse to an injection of three ounces of oil of turpentine blended with fluid.*

Two cases (*Dublin Hospital Reports*, vol. iv., p. 45) of violent painter's colic soon yielded to the application of tobacco stupes to the abdomen, followed by the exhibition of cathartic pills, with croton-oil, and of a purgative clyster. The introduction of tobacco-smoke into the rectum is proper in obstinate cases, taking care not to continue it too long when the pulse and powers of the constitution begin to sink. Sydenham extols this practice in high terms. Injections of an infusion of tobacco are said to have been first recommended in this disease by Lentin.—(*Mem. circa Aerem, vitæ genus*, &c. *Clausthaliensium*. Götting. 1779.)

When all usual plans prove unavailing, the bowels may sometimes be made to act by dashing cold water on the legs and belly.

Colica rhachialgia, besides being attended with perils arising from obstruction of the intestinal tube, has also another source of danger by the inflammation of the bowels, with which it may become joined. From being a spasmodic complaint, says Dr. Elliotson, or a paralytic one of the intestines (as others declare), it may become an enteritis. The symptoms are at first colic; the pain comes and goes; and there is no pyrexia; but, after a time, tenderness of the abdomen, fever, and all the marks of abdominal inflammation show themselves; and ultimately mortification. Hence the occasional necessity for leeches, and venesection; but unless the obstruction be removed, antiphlogistic treatment will not avail.]

Those who have had this disease are liable for a long time to fresh paroxysms; and the slightest exposure to the same cause will be sure to reproduce it; yet the appearances in different persons, as well afterward as during the attack, are extremely variable, from difference of idiosyncrasy: a correct idea of which may be best, perhaps, obtained from Dr. Warren's description of thirty-two domestics of the Duke of Newcastle's family, then residing at Hanover, who were all seized with rhachialgia, after having used, as their common drink, a small white wine that had been adulterated with some of the oxydes of lead. They were all attacked in the common way, except one, whose first assault was an epileptic fit. This patient, as soon as the pain in the bowels which succeeded to the fit had ceased, had his head again affected, was troubled with a St. Vitus's dance, and died epileptic in less than a fortnight. Three were feverish from the beginning to the end of the disease. The rest were without fever till the fourth or fifth day, their pulse becoming quicker as the pain began to abate. In some the mouth was made sore by the acrimony of the matter vomited up. Four fell into a salivation for several hours every day, and said that their pain was abated during the spitting. Many had profuse sweats, and a few an eruption of red and white pimples just before the disorder terminated. One was delirious during a part of the time, but recovered. All relapsed within four or five days after they seemed to be cured. Some relapsed several times for several years. One only was rendered permanently paralytic and costive.—(*Med. Trans.*, vol. ii., p. 86.)

The most useful means of guarding against a paralytic diathesis, or of removing the paralytic sequel, where recourse can be had to them, are the Bath waters. And where the circumstances of the patient will not allow him to have the benefit of these, the spine may be advantageously rubbed night and morning with the warm balsams or resins dissolved in spirits;*

* Dr. Flint (*New-England Journal*) has cured a case of colica rhachialgia of long standing, by the oil of turpentine.—D.

* M. Ranque, principal physician of the Hôtel Dieu at Orleans, in a memoir on the colic of Poictou (in Archiv. de Méd., Paris, 1825), recommends counter-irritation on the abdomen, by means of a plaster containing camphire, theriaca, hemlock, tartarized antimony, &c. He rubs every painful part with a liniment, composed of the aqua-lauro cerasi, ʒij.; ether sulphuricum, ʒj.; and extract of belladonna, ɔij. He also administers twenty drops of an ethereal tincture of the leaves of belladonna, and ʒiv. of olive, or sweet almond-oil, as a clyster. The loins are covered with a plaster, two thirds of which are extract of hemlock, and one third emplastrum plumbi.—Ed.

and the common restorative process of air, exercise, friction, and tonic medicines should at the same time be had recourse to, and persevered in for many weeks, or even months, without remission. [The continued use of aperients has great effect in preventing a relapse.—(*Gregory's Elements*, &c., p. 514.) It is obvious that the return of colica pictonum can never be effectually prevented, unless those avocations and beverages are relinquished which exposed the patient to the influence of the poisonous metal by which the disease was excited. A painter should also leave off the clothes in which he has been accustomed to work.

With respect to the paralytic affection of the hand and fingers, Dr. Pemberton found it much benefited by keeping these parts extended on a kind of handboard, splint, or battledoor. Blisters have also done good. M. Magendie recommends, for the removal of paralysis, the use of strychnine, which has been successfully tried by Dr. Graves.—(*Dub. Hosp. Rep.*, vol. iv., p. 46.) It may be given in the dose of one tenth of a grain, which may be increased to one eighth, three times a day. In one case, recorded by Dr. Elliotson, he tried this medicine and shocks of electricity; though he had seen benefit result from strychnine in other instances, the cure which followed in this example, is referred by him entirely to the electricity; first, because the dose of the medicine was only increased to one eighth of a grain, and no catching and tingling of the parts occurred, which are well known to be the first effects of this powerful remedy. After the sudden discontinuance of it, the cure also proceeded as rapidly with the electricity alone as with both means united.* Electricity he regards as one of the best local applications. He advises it to be applied every day, not only to the hand, but the forearm, and thinks he has seen sparks answer better than shocks.]

SPECIES III.

COLICA CIBARIA.

SURFEIT.

THE PAIN ACCOMPANIED WITH NAUSEA, HEADACHE, AND DIZZINESS BEFORE VOMITING, AND AFTERWARD TERMINATING IN A GRIPING LOOSENESS.

I HAVE already had occasion to remark, that the stomach is one of the most capricious organs of the entire system; and hence we often find persons in an unsuspected state of health complaining, that even the ordinary meal to which they are accustomed sits upon it with a less degree of comfort and satisfaction than usual. And it is hence not at all to be wondered at that, when the stomach is overloaded with plain food, and still more with high-seasoned dishes, and heady malt liquors and wines, the pain and sickness of colic should ensue, and that those organs which are in closest sympathy with the stomach, and particularly the head, should participate in the affection.

The same effect is not unfrequently produced by swallowing the husks, stones, or kernels of fruit with the fruit that is eaten, all which the stomach may at the time, or perhaps at all times, be incapable of digesting, and some of which have in a few instances remained so long as to germinate before their rejection; examples of which are given in the author's volume on Nosology.

When the stomach of the newborn infant is filled with any other food than its mother's first flow of milk, which is purgative, and removes the viscid meconium with which the alimentary canal is gorged, tormenting pains of a like kind follow: and if much air be extricated, the infant is overpowered with flatulence; and the present species becomes connected with the ensuing, and exhibits the oppressive distinction of wind-colic.

These are the common causes of the species before us, which is characterized by a greater or less intensity of the symptoms enumerated in the definition. But we often find it also originating after meals from causes that are more obscure, and with various other symptoms of a still more violent and distressing nature, as though the food itself had proved poisonous, or some poisonous substance had been intermixed with it. These additional symptoms are of two kinds: in the one, we meet with an intolerable sense of suffocation, the throat constricted, the face and eyes swollen, inextinguishable thirst, a burning heat all over the body, a quick small pulse, an intolerable itching or pricking in the skin, and an efflorescence on the surface, sometimes in the form of minute red millet-seed papulæ, sometimes in that of weals; twitching of the tendons, and a peculiar kind of delirium; the cuticle peeling off on the subsidence of the attack: the whole evincing great malignity of action, as though the cause were of a septic nature. Under the other set of symptoms, in addition to those noticed in the definition, we meet with great anxiety and difficulty of breathing, dejection of the spirits, spasms in the limbs, as well as in the abdominal organs and muscles, tenesmus, coldness of the extremities, loss of sight and hearing, convulsions, or coma.

The symptoms, however, vary considerably according to the general nature of the constitution. For the most part, they are sufficiently distinct; but in many persons they are strangely united; and the lethargy, tenesmus, or coldness of the extremities, may be combined with the cutaneous eruption. And hence esculent colic may be justly contemplated as ramifying into the three following varieties:—

a Crapulosa. Common surfeit.	The symptoms indicating an overloaded stomach, and usually ceasing on the evacuation of its contents.

* See Clinical Lect. in Lancet for 1830–1, p. 333. But, notwithstanding the inference drawn from this particular case in relation to strychnine, Dr. Elliotson makes a more favourable report of the effects of the medicine in other instances of this paralysis, where he tried it. "This is a species of paralysis," says he, "where I have exhibited strychnine with decided advantage."—See Med. Gazette for 1833–3, p. 552.

β Efflorescens. Eruptive surfeit.	The symptoms evincing the action of some noxious, deleterious principle; the skin covered with an efflorescence.
γ Comatosa. Comatose surfeit.	The symptoms evincing great nervous irritation, with a rapid exhaustion of the sensibility.

In the FIRST OR SIMPLE FORM of the disease, the violence of the symptoms generally works its cure. But if the nausea should exist without vomiting, a simple emetic of ipecacuanha should be given to excite the stomach to a more perfect inversion of its action, which should be followed the next morning by a brisk purgative. In the colic of newborn infants, from viscid meconium, the purgative alone will be sufficient, and the best medicine for this purpose is castor-oil. If the congestion should proceed from an enfeebled state of the stomach, and too long a retention of the food in its cavity, it will be afterward requisite to put the patient on a course of stomachic or general tonics, of which we have taken a sufficient survey in the preceding description of dyspepsy.

It is possible that the SECOND VARIETY may occasionally proceed from a morbid irritability of the stomach operating upon a tolerably full meal of the most bland and innocuous viands; but it more generally proceeds from *animal* foods of a particular description, or eaten under particular circumstances, as comatose surfeit does from poisonous *vegetables* intermixed with common food. The animal substances that chiefly operate in the manner above described, producing a dreadful feeling of suffocation, swelling of the face and eyes, intolerable thirst, a burning heat on the surface, pricking or itching on the skin, succeeded by an eruption of some kind or other, and accompanied with the specific symptoms of griping pain, vertigo, and vomiting —are shellfishes, and fishes of a few other kinds, as muscles, which are perhaps the most frequent of all causes, some species of scallops and other coarse ostraceous worms, the land-crab (*cancer ruricola*), lobster (*c. gammarus*), conger-eel (*muræna major subolivacea* of La Cépède), gray-snapper (*coracinus fuscus major*), and yellow-billed sprat (*clupea Thryssæ*, Lin.), the baracuta, the kingfish, and several other species or varieties of scomber, as the bottlenose and ambar, the smooth bottlefish (*ostracion glabellum*), and the rockfish (*perca marina* of Catesby). There are also many others; but these are sufficient as specimens.*

As all these are among the edible productions of the ocean, and hence are eaten very generally as nutritious foods, it is a question of great importance, and which is yet open to discussion, what are the circumstances in which they occasionally disagree with the stomach, and produce the above symptoms?

It has been supposed by many pathologists that the mischief is occasioned by some poisonous property being conveyed into the body of the fish in the form of food; by others that it is the result of a change taking place in its general frame by the approach of the spawning season or some other period of life, or in consequence of its removal into a different climate; and by others again, that it depends altogether upon the idiosyncrasy or peculiar state of the constitution, or of the digestive organs of the persons that are thus affected.

[From an interesting paper by Dr. Combe of Leith, on the poisonous effects of muscles, we learn that muscles which had produced such consequences, and had been taken from a wooden bar in the wet-dock, had no very positive mark by which they could be distinguished from other muscles gathered elsewhere. His friend Dr. Coldstream was of opinion, however, that their livers were diseased, being darker and larger than natural. This disagrees with the investigations of Dr. Ferguson (*Edin. Phil. Journ.*, vol. i.), who arrived at the conclusion that the deleterious effects are not connected with any organic change in the animal; but, as Dr. Combe has remarked, some change may happen in the structure or secretions of the animal, beyond the sphere of our detection. The animals were quite fresh, and had no peculiar smell nor taste. The most delicate chymical tests gave no indications of cupreous impregnation; nor could a comparative chymical analysis of the poisonous and healthy fish, undertaken by Dr. Christison, discover any peculiar principle in the former, or any difference in chymical nature between them. The poisonous effects of the muscles gathered from the above wooden bar were not confined to the human race, a cat and dog having also been killed by eating them, though other muscles, gathered in the vicinity of the dock, were eaten by such animals with impunity. —(*Edin. Med. and Surg. Journ.*, No. 94, p. 86.) The supposition of a cupreous impregnation of the poisonous fish in the West Indies, has been ably refuted by Dr. Burrows.—(*London Med. Repos.*, vol. iii., p. 443.) The above particulars serve also to weaken the notion of putrefaction.]

That many of the animals which prove thus noxious have derived their mischievous quality from some poisonous mineral, vegetable, or animalcule on which they have fed, seems probable from the well-known fact that many of the most harmless and easily digestible species, if eaten without being disentrailed, grievously disorder the stomach, and occasion many of the symptoms above noticed; while even the baracuta, which is ordinarily one of the most deleterious in its effects when eaten whole, becomes bland and innocuous to most persons when thoroughly cleaned, gutted, and salted. There is also, in many cases of the disorder hereby

* The American journals mention many facts of this kind. Dr. Mease, of Philadelphia (New-York Med. Repos., vol. i., p. 161), has recorded several cases demonstrating the serious consequences arising from the poisonous quality of pheasants, (*tetrao cupido*, Lin.) Dr. Barton (*Trans. of the Am. Phil. Society*, vol. v.) has stated cases of the poisonous effects of honey; and two cases of a similar character may be seen in Hosack's Medical Essays, vol. ii.—D.

produced, a strong metallic and especially a coppery taste in the offending substance when rejected into the mouth, and which continues to affect the fauces for a long time afterward,—[though, as is above related, no copper can be detected in poisonous muscles.] M. Orfila has accurately noticed this last symptom in several of the cases he has enumerated; and especially in an example of this disorder originating in a mixed company of whites and blacks who had fed on the conger-eel, in the island of Grenada, in April, 1791. "The negroes," says he, "suffered more than the whites; they all experienced a coppery taste in the mouth, and a sensation in the œsophagus, as if it were excoriated."—(*Traité sur les Poisons*, &c., tom. ii., sect. 1006.)

It is in vain to urge that what is thus poisonous to man, must have been at least as noxious to the animals that fed upon it; for poison is a relative term, and it is highly probable that there is scarcely a vegetable or mineral substance but may be eaten, I do not say harmlessly, but even as a safe and nutritious food, by animals of some kind, however destructive to others. The land-crab is well known to feed on the manchineel tree (*hippomane mancinella*); the loxia or grossbeak of the Bahamas on the fruit of the *amyris toxifera*, or poison-ash; partridges on the leaves, and bees on the flowers of the *kalmia latifolia*, which are death to sheep, to horned cattle, and to man. So the *cicuta virosa*, or long-leaved water-hemlock, the most virulent plant that grows spontaneously in England, though fortunately not very common to our pastures, is fatal to cows, while sheep and horses eat it with impunity, and goats devour it with greediness; a fact well known nearly two thousand years ago to the first naturalist of ancient Rome, and thus fully described in his poem, De Rerum Naturâ.—(Lib. v. 897.)

—"Videre licet pinguescere sæpe CICUTA
Barbigeras pecudes, homini quæ est acre venenum."

On the contrary, while horses feed with avidity and thrive to fatness on the *agrestis arundinacea*, or reed bent-grass, Linnæus, as he tells us in his Travels in Schäne, found a number of goats perishing in an island in which this was the chief herbage.

This interesting subject is pursued with great spirit and high advantage to the most important purposes of practical husbandry, in several articles published in the Swedish Amœnitates Academicæ; which give us tables of the best and most agreeable foods for cattle and other domestic animals, deduced from an exercise of that wonderful instinctive power of selection which enables them to discern and to crop those that are a nutritious food for their own species, and to reject the rest. By one of these tables it appears that, of four hundred and ninety-four species of indigenous plants of Sweden, three fourths of them common to our own country, which were offered to horned cattle, two hundred and seventy-six were eaten, and the rest refused; that goats, out of four hundred and forty-nine species, rejected a hundred and twenty-six; sheep, of three hundred and eighty-seven, would not touch a hundred and forty-one; horses turned away from two hundred and twelve out of two hundred and sixty-two; and swine, out of two hundred and forty-three, made choice of only seventy-two.—(Vol. ii., art. 25. *Pan Suevicus. Resp. N. L. Hesselgren*, 1749.) In another volume of the same interesting work, we have a like series of experiments on a great diversity of insects and worms, with a view of ascertaining how many of them are devoured or rejected by our common poultry (vol. viii., art. 163. *Esca avium domesticarum. Resp. P. Holmberger*, 1774); to which, however, I can only refer, and must leave the reader to consult it at his leisure.

It is hence perfectly clear that no argument against the existence of esculents in the interior of animals, deleterious to the health of man, can be drawn from the position that such esculents must also prove noxious to the animals that feed on them.

It is at the same time well known that a considerable change takes place in the taste and nutritive qualities of many species of fishes, at various seasons and periods of life, by which they are divested of their nutritive power, and are rendered far less easily digestible; and which consequently lays a foundation for various affections of the stomach. This is particularly the case with the more luscious or oily kinds; as the herring, mackerel, eel, and salmon, all of which are unwholesome, if not pernicious, when out of season. We may also reasonably conclude that climate has a considerable influence upon them, since the most pernicious species are those that exist in the intertropical seas.

It is, however, equally certain, that the disorder before us is, in many instances, rather dependant upon idiosyncrasy, or a peculiar condition of the stomach at the time, than upon any quality essentially noxious in the fish itself; for out of twelve or more persons dining together from the same diet, we often find only a single individual affected with the disease before us, while all the rest not only escape, but have made a nutritious and a healthy meal. Even in the same family we occasionally meet with almost as many distinct idiosyncrasies in this respect as there are individuals. Of three sisters, M. Orfila tells us that one was incapable of eating muscles, at any time, without great disorder of the system at large, as well as of the stomach; that the second experienced a like effect from herrings; and the third, from feeding on strawberries. And hence many pathologists have been induced to ascribe every case of colic, from the variety of surfeit before us, to idiosyncrasy alone. But the frequent examples we meet with of the affection extending through every individual of a large party that has fed on the same food, forbid us to limit our ascription of the disease to this single cause. [The symptoms caused by poisonous muscles are carefully detailed by Dr. Combe. In general an hour or two elapses before any ill consequences are felt; and then the bad effects consist rather

in uneasy feelings and debility, than in any complaint about the stomach. In two or three hours, however, a slight tension of the epigastrium is complained of. Cardialgy, nausea, and vomiting occasionally take place, but not generally, nor for any considerable time. A prickly feeling in the hands; heat and constriction of the mouth and fauces; some difficulty of speaking and swallowing; numbness about the mouth, gradually extending to the arms; and great debility of the lower limbs,—are the ordinary symptoms. Some patients have a bad or coppery taste in the mouth. In the abdomen a slight pain is experienced, which is increased by pressure, particularly in the region of the bladder, the functions of which are variously disturbed. In some patients the secretion of urine is suspended; in others it is free, but passed with pain and effort. The action of the heart is feeble; the breathing unaffected; the countenance pale and anxious; the skin cold; the mental faculties unimpaired.—(*Dr. Combe, in Edin. Med. and Surg. Journ.*, No. 94, p. 89.)]

The principles of cure are of easier comprehension than the etiology. The peccant matter must first be discharged from the stomach by an emetic of rapid action, as about half a scruple of white vitriol; shortly after which the lower belly should be stimulated to a like discharge, so that as little of the material as possible that disagrees with the digestive organs may remain in them. The history of the symptoms shows us that the living power is rapidly, prodigiously, and sometimes alarmingly exhausted; whence indeed, in many cases, the tremors, sense of suffocation, faintness, sinking of the pulse, and general depression of strength; as also the swellings that take place through every organ where the cellular substance exists in considerable abundance. It is hence highly important to rouse the system with all speed, by means of the most diffusible stimulants, and warmest cordials and tonics, which may be commenced as soon as the stomach has been evacuated; the most useful of which are sulphuric ether, nitrous ether, ammonia, capsicum, and vinegar diluted with water, sweetened and drunk in abundance. The acids obtained by fermentation answer better in this case than any others, because they possess more of an alcoholic principle. And it is truly striking to notice the almost miraculous power which is sometimes exhibited by this cordial plan of attack. Upon the administration of a single strong dose of ether, the patient, apparently in the act of expiring, has in various cases felt all his symptoms vanish in a very few minutes as by enchantment (*Orfila*, tom. iv., sect. 1008; *Dulong, Gazette de Santé*, Oct. 1, 1812); the pains have ceased; the absorbents, and indeed every other set of organs, recovered their wonted energy; the general intumescence has subsided, and the nettle or other rash disappeared. If, however, the system have been shaken more deeply, and the symptoms do not yield with much readiness, the tonic plan must be persevered in for many days or even weeks.

The THIRD VARIETY is usually produced by pernicious vegetables, instead of animals, that have been taken for food, or along with food; or esculent vegetables that disagree with the stomach, as in the preceding variety, from a morbid state of this organ, or from a peculiarity of constitution. I have already observed that the symptoms in this modification of the disease evince great nervous irritation with a rapid exhaustion of the sensibility. There is severe spasmodic pain in the intestinal canal, with cramp, spasms, or convulsions, extending over the system more or less generally, accompanied with or succeeded by a lethargic drowsiness, from which it is often difficult to rouse the patient; and from which, also, when roused, he instantly relapses into convulsive agitations; evidently proving that an acrid and a narcotic principle are combined in the unsuspected cause. This cause is usually mushrooms, or rather deleterious fungi that have been mistaken for the genuine edible mushroom, or *agaricus esculentus*. The agaric is so extensive a genus, and many of its species, to an unpractised eye, have so near a resemblance to each other, that it cannot be wondered at that such a mistake has been committed: though perhaps the plants that, through such an error, have been most frequently gathered, are the bulbous agaric, the Medusa's head, the raven's eye, the hemlock mushroom, and the *agaricus muscarius*. It is possible, indeed, that even the genuine mushroom itself may prove deleterious to some idiosyncrasies, or to some stomachs in a morbid state of constitution; but then the mischief is in almost every instance confined to an individual alone, the rest of the company eating of the same dish with satisfaction and pleasure.

As there is no critical mark to determine at once between poisonous and salutary mushrooms, we may lay it down as a general rule, that those should be suspected and avoided that grow in moist and marshy grounds, and especially in the shade; that have a dirty-looking surface, and whose gills are soft, moist, and porous. For the most part the smell of these is virulent, and they are covered with a calyptre or veil.

There are, however, a considerable number of other vegetables that produce a like effect when taken by accident for food, or along with food; as the *cicuta virosa*, or water-hemlock, the leaves of which have been mistaken for smallage, and the tap-roots for parsnips; the *æthusa cynapium*, or fool's parsley, which has been culled for common parsley; and the *secale cornutum*, or spurred rye. The last is productive of very serious evils in different forms, and we shall hence have occasion to return to it when describing erythematic pestis, and mildew-mortification, both which also result from its use. Rye becomes spurred or horned in the shape of its ear, apparently from having numerous punctures made by different insects in the fresh pullulating grains of the glume, as a midus for their minute eggs, in the same manner as the nut-weevil (*curculio nucis*) pierces the young and tender nut of the hazel for the same purpose. And as the effects produced by the

grain thus diseased are very different in different seasons or climates, we have reason to believe, that its juices are themselves rendered noxious in a different manner, according to the species of insect that makes the attack. It is also said that the common garden rue (*ruta graveolens*), when eaten to excess, is succeeded by the same symptoms of ventricular pains, spasmodic action, and coma, though in a less degree; but I have never seen such consequences, and have reason to think that they have been overrated.

Most of these symptoms are also produced by feeding on soups, or other dishes, that have been cooked in copper vessels containing verdigris. We have the same violent gripings and muscular commotions, excited by the acid quality of the plant just noticed, and in almost all instances headache and confusion of intellect, and sometimes coma. In all these cases, however, we can easily detect the nature of the poison, by the intolerable coppery taste of the mouth, and the green or greenish-yellow colour of the matter rejected from the stomach.

The cure, as in the preceding variety, must be promoted by evacuating, in the first instance, the poisonous principle, as largely as possible, from the stomach. Where the local irritation is great, demulcent mucilages should succeed; or soap where the effect has been produced by salts of copper. After which, if there be much general convulsion or other irritation of the nervous system, it must be allayed by opiates.

SPECIES IV.

COLICA FLATULENTA.

WIND-COLIC.

PAIN ACUTE, EXTENDING TO THE PIT OF THE STOMACH, OFTEN IMPEDING RESPIRATION; ACCOMPANIED WITH GREAT FULNESS AND FLATULENCE; AND RELIEVED BY PRESSURE, BENDING THE BODY FORWARD, OR EXPULSION OF WIND.

THIS species is produced by crude and flatulent fruits, and whatever lowers the tone of the alimentary canal; as too long fasting, fear, or grief, and all the causes of dyspepsy, with which it is often complicated, and to which the reader may turn. Like dyspepsy, indeed, it seems to depend upon local debility, whose seat is in the small intestines, and consequently in the direct neighbourhood of the stomach. It is often accompanied with great costiveness, from the spasmodic action, which runs in a larger or less degree through the whole of the intestinal canal, and considerably adds to the torture, and increases the tumefaction and tenseness of the abdomen; which are sometimes so extensive as to resemble *emphysema abdominis*, or tympany.

The last symptom is peculiarly striking and oppressive in persons of an hysteric diathesis, who are attacked with this complaint from very slight causes; and in whom it is often combined with syncope or clonic spasms of various kinds.

In attending to the means of cure, we may here proceed at once with some degree of boldness; since, notwithstanding the violence of the pain, it is not often that inflammation is to be apprehended, at least in the commencement of the disease: and hence the warmest carminatives, and even alcohol, may be had recourse to; for whatever will carry off the flatulence, will carry off the pain and costiveness. Hence a spoonful of brandy, or, which is better, a dose of tincture of rhubarb, ammonia, infusions of herbs containing essential oils, as mint, peppermint, pennyroyal, are generally consoling and salutary. For the same reason, the aromatic spices may be had recourse to with success, and particularly in connexion with opiates. Of the spices, the nutmeg, on account of its greater volatility than most others, and especially on account of its established reputation for producing quietism and even sleep, has a peculiar claim to attention.

The only disadvantage of opium is, that it has a tendency to diminish the intestinal, and indeed all the secretions, excepting that of sweat: and, on this account, it has been objected to by many physicians; but, from its power of allaying spasmodic irritation, and consequently of producing ease, it becomes of so much importance, that it ought unquestionably to be called into use: and there are cases in which, from this very power alone, it may indirectly act the part of an aperient. The opiate confection, as combining an aromatic with a narcotic principle, is a highly valuable as well as an elegant preparation. And after the pain has subsided, an active purgative, according to the course recommended by Dr. Cullen (*Mat. Med.*, vol. ii., p. 249), may be administered.

Opium may also be given in the form of an injection, which should not exceed five or six ounces, for otherwise it will probably be thrown back. It will be often of great use to unite with the narcotic a pretty free dose of turpentine, or some of the warmer balsams, especially that of copayva; and to apply rubefacients to the epigastric region.

The convalescent treatment may be the same as already recommended under dyspepsy.

SPECIES V.

COLICA CONSTIPATA.

CONSTIPATIVE COLIC.

THE GRIPING PAIN SEVERE; THE COSTIVENESS OBSTINATE; GREAT TENSION, WITH LITTLE FLATULENCE: THE VOMITING SOMETIMES ACCOMPANIED WITH FECES; THE COSTIVENESS WITH BLOODY STRAININGS; TERMINATING, WHERE NOT FATAL, IN A FREE DEJECTION OF THE INFARCTED MATTER.

THE pain is here produced by indurated meconium, or feces, or other intestinal concretions, and especially those which are known by the name of bezoards, and will be hereafter described under the genus ENTEROLITHUS: and we hence obtain the following varieties:—

α Meconialis. From viscid meconium. Colic of newborn infants.

β Fæcosa. Stercoraceous colic.	From indurated feces.
γ Enterolithica. Stony colic.	From bezoards, and other intestinal concretions.

The first two of these varieties are the result of a superabundant action of the intestinal absorbents, or of a deficiency in the peristaltic power of the intestinal tube; in consequence of which, from the length of time the confined materials occupy in completing their descent, the meconium in infants becomes so viscid as not to be urged downwards, and remains in the intestines till it grows acrid; and the feces of later life, exhausted of moisture, hardened into one solid mass, possessing the figure of the intestine, or, separating into smaller pieces, appear, when discharged, in the shape of balls or buttons, often as hard as sun-burnt clay, and have been called, though not quite accurately, scybala; yet sometimes they make a near approach to this substance, and consist of masses of indurated feces, combined with a certain portion of mucus or oleaginous matter secreted into the intestines, and producing a cetaceous or soapy feel.

Of the stony variety, the following is an extraordinary example related by Dr. König of Berne.—(*Phil. Trans.*, year 1686.) A young woman of twenty-five years of age, by name Margaret Lawer, after an anomalous and general disorder, discharged continually the contents of the intestines, and even the clysters that were injected, by the mouth, and at length a number of stones as hard as flint, some in fragments, some of the size of peas, others of that of filberts. A clashing of stones against each other was felt by pressing the hand upon the abdomen: there was great constipation, severe gripings, and dysury; and the urine, when voided, was often loaded with a gravelly matter. The aliment and injections being constantly returned by the mouth, Dr. König desisted for four months from offering her either meat, drink, or medicine of any kind, excepting occasionally a spoonful of oil of almonds. Blood was now and then vomited, from the violence of the spasmodic affection of the stomach; and frequently urine to the amount of three or four ounces at a time, of a strong taste and smell. The disease seems to have lasted, with remissions, from January, 1681, to February, 1683, at which period the history is abruptly dropped, though the patient seems to have been in a state of recovery. It was preceded by the appearance of vesicular eruptions on the skin. The chymical examination of the calculi is loose and unsatisfactory.

The oleaginous purgatives, soap injections, and mucilaginous diluents, to diminish the irritation of the intestinal absorbents, will here be found most successful. Small doses of neutral salts, sulphur, and acidulated drinks, may also be of service in promoting the latter intention. If the griping be severe, and the case urgent, terebinthinate injections, in the last two varieties, will also be highly expedient, and not unfrequently produce speedy relief. In these cases the injections should be copious, so that the fluid may readily insinuate itself between the imprisoned matter and the coats of the intestines: and the turpentine should not be less than from half an ounce to an ounce, diligently triturated with yolk of egg, so as to be perfectly diffused and suspended in the menstruum. "Thus prepared, we have found it," says Dr. Cullen, "to be one of the most certain laxatives that can be employed in colics and other cases of obstinate costiveness."*

SPECIES VI.
COLICA CONSTRICTA.
CONSTRICTIVE COLIC.

A SENSE OF STRICTURE IN SOME PART OF THE INTESTINAL CANAL; OFTEN OF FLATULENCE, GRADUALLY PASSING OFF BY THE STRICTURE; THE BOWELS TARDY; DISCHARGING WITH DIFFICULTY SMALL LIQUID STOOLS.

This species bears a near approach to *proctica callosa*, or the callous contraction of the rectum; which last, however, as accompanied with less griping and flatulence, and consequently having less of the character of colic, and more particularly from its being in most cases within the reach of manual examination and surgical aid, and capable of assistance by a different mode of treatment, is entitled to a distinct consideration.

[Stricture of the intestines, in the early stage of the disease, gives rise to colic pains and costiveness, alternating with bilious diarrhœa. After some time, solid feces are very rarely passed, and only after a great effort; and they are of an extremely slender calibre.]

The proximate cause of the disease before us is a permanent stricture existing in some part of the intestinal canal beyond the reach of the finger, from callosity, scirrhosity, a ring of tubercles or caruncles, or whatever else has a tendency to thicken its coats and diminish its diameter [Strictures are more frequently met with in the colon and rectum, than in the small intestines: and Dr. Monro has seen the natural diameter of the colon so much reduced, that an ordinary quill would hardly pass the constriction. When the stricture is great, the bowel is generally enlarged above it (*Baillie's Works, by Wardrop*, vol. ii., p. 158), and even ulcerated. Sometimes, indeed, it gives way; its contents are effused; and the patient, after labouring under colic for a few hours, is suddenly seized with very acute pain in the abdomen, rapidly followed by a sud-

* Mat. Med., vol. ii., p. 181. Every man of experience is aware, that when a person takes chalk mixture, or magnesia, in considerable quantities, intestinal concretions are liable to be formed, unless the bowels be well cleared out occasionally with a brisk purgative. The carbonate of iron will sometimes accumulate in the bowels in large masses, creating obstruction. Dr. Elliotson has known collections of it take place in the rectum. He had a patient labouring under tetanus, to whom he gave this remedy with success; but, when purgatives were not given, there was pain in the rectum, and it was necessary to pick the iron out of it: a shovelful was found in his bed.—(See Med. Gazette for 1832-3, p. 598.)—Ed.

den sinking of the pulse, cold sweats, and death. —(*Morbid Anatomy of the Human Gullet*, &c., p. 301, 302.) When scirrhus affects the bowels, the diseased portion of them is always rendered narrower, and sometimes nearly impervious. According to Meckel, the disease begins in the peritoneal coat and glandulæ muciparæ, whence it afterward extends to the muscular and villous coats. The effect of it is to confound together all the tunics, to thicken and harden them, and, in the end, to produce cancerous ulceration.—(*Bourdon, Revue Méd., Mai, 1824, and Meckel's Anat.*, vol. iii., p. 296.) The muscular coat is also subdivided by membranous septa, and the internal one sometimes projects in the form of hard irregular folds. In persons of advanced age, scirrhus of the large intestines is not uncommon, and it mostly attacks the sigmoid flexure of the colon or the rectum. The reason of this fact is referred by Dr. Baillie partly to the villous coat of the lower end of the great intestines containing many glands, and partly to the sigmoid flexure of the colon being naturally its narrowest part, and most liable to be irritated by the passage of hard substances. But though strictures are most frequent in the colon and rectum, they are sometimes met with in the small intestines. In the Museum of the University of Edinburgh is a specimen of a stricture, extending seven inches along the ileum. —(*Monro*, op cit., p. 301.)

Besides the foregoing scirrhous disease, by which the intestinal tube may be obstructed, there are other morbid alterations by which the same consequence may be produced. One is an elevation of the mucous membrane into thickened folds by an accumulation of the cellular membrane.—(*Baillie's Works*, vol. ii., p. 159.) Another is a thickening of the mucous or villous coat alone, coagulable lymph being effused upon it. In the collection of Mr. A. Burns is a specimen taken from a child, where a gelatinous substance, mixed with coagulable lymph, adhered very intimately to the villous coat of the sigmoid flexure of the colon and the rectum; and above the sigmoid flexure, the intestine had given way. In some instances the intestine is completely filled with coagulable lymph, which may either be voided by stool, or remain and prove the cause of death.—(*Monro's Morbid Anatomy*, &c., p. 119–122.) The intestinal canal, and particularly the colon and rectum, are sometimes the seat of polypi, or of various other excrescences, some of which are hard and solid; others spongy, loose, and soft. One is termed miltlike by Professor Monro, and has a very fetid smell: Meckel (*Anat.*, vol. iii., p. 297) expresses a conviction that the disease here alluded to is in reality fungus hæmatodes: but such a case is rare, and has never been seen by Mr. Wardrop. —(*Baillie's Works*, vol. ii., p. 161.)]

The colon and rectum, highly sensible in a state of health, are peculiarly irritable from the diseased action, and the specific symptoms are the consequence of irritation produced by the mechanical pressure of the feces; and often by acrimony from the retention. In most cases the stricture lies beyond the reach of topical applications. Purgatives afford but temporary relief.—(*Monro's Morb. Anat. of the Human Gullet*, &c., p. 302.) Of late the conium has been chiefly trusted to, in conjunction with the mercurial pill. But I am not aware that these have proved decidedly advantageous. The spasmodic attacks must be encountered by the remedies already recommended in spasmodic and flatulent colic: and the habitual uneasiness felt in the intervals, will be best alleviated by a rigid attention to a light, liquid, and aperient diet. Unfrequent as this disease is in general practice, I happen to have at this time two patients labouring under it: one a lady of about thirty-five years of age, who has been subject to it for ten years, and is incapable of passing feces more voluminous than those of an infant; and the other a man, forty-nine years old, who has laboured under the disease for twenty-one years, and can never pass a motion larger than a crow-quill. Yet, by strict attention to diet, both are able to exist, with only occasional inconvenience and pain; the last married about two years since, and his wife has lately brought him twins. He lives upon liquids altogether.

[As the sigmoid flexure of the colon, near its termination in the rectum (*Penkivil, in Edin. Med. and Surg. Journal*, No. 72), is frequently the seat of the disease, this part should be carefully examined in every case of total obstruction of the bowels, not arising from hernia. It is requisite for the purpose, says Dr. Willan, to employ a bougie thirteen inches long, and of a proportionate strength. He adds, "I lately saw a lady thus relieved, who had been twenty-six days without any evacuation from the bowels, and who seemed nearly exhausted by violence of pain and distention of the abdomen, hiccough, cold-sweat, &c. It is remarkable how long patients subsist under these distressing circumstances. In one instance, the time was twenty-nine days; in another, thirty-three days. As the latter patient recovered, after enduring every torture such a disorder could inflict, practitioners may be encouraged to persevere steadily in their attentions."—(*Willan on Diseases in London*, p. 185.) When this species of colic depends upon the presence of a polypus, or other excrescence in the intestinal canal, beyond the reach of surgical means, the palliation of symptoms is all that can be attempted. The true nature of such cases is scarcely ever ascertained till after death.

GENUS VII.
COPROSTASIS.
COSTIVENESS.

OBSTINATE RETENTION OF THE FECES IN THE INTESTINES.

THE generic character is expressed in the generic name, which is a compound term, importing emansion or retention of feces—κοπροστασις, from κοπρος and ιστημι, whence the well-known and opposite terms *copragoga* and *eccoprotica*, to express purgatives, or such medicines as quicken the passage of the feces.

Whether mere tardiness of evacuation should always be regarded as a disease, may be ques-

tionable: some persons are accustomed to have their bowels moved not oftener than twice a week; and to such a week's costiveness is attended with no inconvenience. [The proximate cause of constipation may consist in an unusual slowness of the peristaltic motion of the bowels, or in an obstruction to the passage of the feces, while the proper peristaltic motion continues. The natural action of the bowels is considerably different in individuals of different constitutions, and even in the same individuals at different periods; so that it is not easy to say when the peristaltic motion can be considered as preternaturally slow, while the general health remains good. But it is probable that in most habits a stool should occur once in twenty-four hours, although many persons retain their feces much longer without inconvenience. Dr. Cullen believed that every deviation from a diurnal stool is an approach to an unnatural state.] Rhodius gives a case of feces retained nearly a month (Cent. ii., Obs. 61); and Panarolus one of three months' retention without mischief. —(*Jatralog. Pentecost.* i., Obs. 1.) Chaptal relates the history of a female, who for four months had no discharge either from the bowels or the kidneys, and as little evacuation by sweat, notwithstanding that her diet was confined to milk-whey and broths. She was at length cured by using the coldbath for eight days successively. When but a very small quantity of food is taken habitually, the egesta bear a like proportion, are small in amount, and usually slender in volume. This is particularly the case with those who are enabled to endure long periods of fasting, as we have already had occasion to observe under *Limosis expers protracta:* and hence the collectors of medical curiosities have furnished us with various examples of feces retained for half a year (*Salmuth*, Cent. i., obs. 24; ii., 65, 98; iii., 26, 45), two years (*Samml. Medic. Wahrnehmungen*, band iv., p. 294), and in one or two instances not less than seven years (*N. Samml. Med. Wahrnehm.*, band i., p. 423), without serious mischief.

In all such cases, the feces are discharged in indurated and minute balls, something like sheep's dung. But it does not always happen that those who labour under this affection eat sparingly. Professor Thomassini of Parma, in 1808, attended a man, thirty years of age, who laboured under an habitual costiveness of this kind, though his appetite was good, and he was accustomed to eat twice as much as other men. He had been costive from his youth, but the torpor of his bowels had increased yearly. From his twentieth to his twenty-fourth year, he had only one evacuation every eight or ten days, which interval was afterward increased to twelve. At thirty, when M. Thomassini saw him, the intervals were extended to twenty-two days. No regimen, nor medicinal process, had produced any benefit. Purgatives, indeed, operated, but occasioned such debility that they could not be persisted in. The heat was natural, but the pulse frequent.—(*Dict. des. Sc. Méd.*, art Cas Rares.)

[A remarkable case was published by Dr. Crampton. The patient, a female, in her thirty-seventh year, had had no evacuation from her bowels for eight months, and only two or three motions in the year preceding that in which the particulars were drawn up. She also passed scarcely any urine, and this with pain. Her usual sustenance was tea, toast, milk, and gruel. The abdomen was free from fulness or swelling. In the intervals of meals, she often voided from the stomach matter of stercoraceous quality, and sometimes of a urinary smell.—(See *Dublin Hosp. Reports*, vol. iv., p. 305, &c.) The same physician refers also to another similar example which was under his care, and in which a stool was considered quite an extraordinary occurrence. After death, the colon was found immensely distended, nearly impervious at its lower part, and the bladder diseased. In the first of these two cases, a stricture of the colon was likewise suspected.] "Dr. Heberden knew a person who, all his life, had but one motion a month: he must have had a great deal to carry about with him; and then, as a contrast, the same physician mentions another individual, who had twelve motions a day for thirty years: that must have been equally troublesome—it was perpetual motion."—(*Medical Gazette* for 1832–3, p. 661.—Ed.)

Costiveness is not necessarily connected with colic, flatulence, or any severe pains; though, as already observed, under particular circumstances, it may become a cause of all these. In its simple and constitutional form, it is generally rather a troublesome than a violent or dangerous complaint. But this is not invariably the case: and a constipated state of the bowels, whether idiopathic, or the concomitant of other diseases, is frequently highly injurious to the constitution; producing, when it is idiopathic, a variety of disorders; and aggravating, when symptomatic, the diseases of which it is a symptom. Costiveness may proceed from two very distinct sources; and as each of these possesses symptoms of its own, and is considerably discrepant from the other, we are enabled with ease to contemplate the genus under the two following species:—

1. Coprostasis	Constipata.	Constipation.
————	Obstipata.	Obstipation.

SPECIES I.

COPROSTASIS CONSTIPATA.

CONSTIPATION.

THE FECES WHEN DISCHARGED CONGESTIVE AND VOLUMINOUS; THE TEMPERAMENT FIRM AND RIGID.

In persons of a compact and robust habit, with hearty appetite and strong digestive powers, the intestinal absorbents occasionally evince an excess of action; and the feces, while they become hardened in consequence of such action, assume, from their copiousness, the figure and volume of the large intestines through which they pass.

The increased action of the absorbents, which

is the common proximate cause of the present species, may be produced by violent exercise, which heats the blood and throws off an excess of fluid in the form of perspiration from the surface; or by too stimulant a diet, particularly of rough port wine. [Travelling in a carriage, or on the water, is said to have greater effect in bringing on costiveness than more considerable bodily activity. The editor is inclined to believe, that it is rather the confinement, and the want of usual exercise, which should here be regarded as the cause of costiveness; and that the complaint may be imputed, with more probability, to a defective state of the biliary and other abdominal secretions, and to inefficient peristaltic motion, than to an increased action of the intestinal absorbents. Dr. Cullen (*Mat. Med.*, vol. ii., p. 496) ascribed costiveness in such cases to the abstraction of the intestinal fluids, secreted from the mucous glands and exhalant arteries. With respect to horse-exercise, the editor suspects that the accounts of its producing costiveness are founded on a mistake, and that it generally promotes regularity in the functions of the bowels, provided its beneficial operation be not counteracted by intemperance. Many persons who are in the habit of riding, are also in the habit of drinking port, brandy and water, and other astringent heating beverages; and if they suffer from costiveness, the exercise on horseback bears the blame that ought to be laid upon their diet.]

Costiveness may be the result of too astringent a diet; as where bread, for instance, is adulterated with a considerable quantity of alum: for the mouths of the secernent vessels of the intestines, which should pour forth a large portion of fluid, become hereby contracted, and secrete but a small proportion. Astringents, also, by giving some degree of rigidity to the muscular fibres of the intestines, retard the peristaltic action, and thus become a second cause of constipation.

As the feces are forced forward by the peristaltic action of the intestines, it is obvious that, whenever this action is weakened, there must necessarily be a retardation, and consequently an accumulation of the feces. This sluggishness or torpitude of the bowels is produced by various causes; for sometimes the food is too insipid and destitute of stimulants, and sometimes there is a deficiency in the secretion of bile, which appears to be a natural stimulus to the internal surface of the intestines; and we have reason to believe, that the latter is sometimes secreted with its qualities imperfect; and sometimes, also, the muscular fibres of the larger intestines lose a considerable degree of healthy irritability, and are reduced to an extreme of paresis that amounts almost to paralysis. And, if this occur, as it does occasionally, without much failure of the appetite, the accumulation of feces will be in some instances prodigious. In the case of a young woman aged twenty-eight, the distention of the abdomen from this cause was so general as to be mistaken for pregnancy, especially as there was occasional sickness, with menstrual suppression, and a sympathetic enlargement of the breasts. The disease terminated fatally in about three years from its commencement. The colon, which was among the late Mr. Taunton's preparations, he was so obliging as to show me: it measured in circumference more than twenty inches, and on dissection was found to contain three gallons of feces.

[The causes which may obstruct the passage of the feces, without any deficiency of peristaltic action, occur either in the intestines themselves, or the neighbouring parts. In the intestines, a mechanical impediment is sometimes occasioned by a thickening of the coats, which straitens the passage, or by scirrhous tumours, especially near the lower extremity of the canal. Sometimes the cavity is partly filled by calculous concretions. The costiveness attending enteritis has also been referred to a lessening of the calibre of the bowels by spasm; but no doubt now exists that it is rather owing to an interruption of the secretions naturally poured into the intestines, and to a diminution in the action of their muscular fibres; for, as Bichat fully ascertained, it is not the character of an inflamed muscle to contract even with its ordinary vigour. Tumours in the neighbouring parts, compressing the intestines, necessarily impede the passage of the contained feces. Hence, in pregnancy, costiveness is a common consequence of the pressure of the enlarged uterus on the great intestines; and a steatomatous tumour in the omentum has been known to produce the same effect.]

A stricture in any part of the large intestines, from whatever cause, has a tendency to produce an accumulation of feces, in the same manner as it produces one species of colic. But colic does not always follow; for the bowels are less irritable than usual, and the stomach continues sound. Strictures in the colon have sometimes existed without being suspected. Dr. Baillie has given a striking example in a case related to him by Sir Everard Home, but a still more striking one from his own practice.* In the last, the patient, a shoemaker, aged thirty, subject to habitual costiveness, became at length much more so; and, from having motions three or four times a week, passed them not oftener than once or twice in a week or a fortnight, and this, moreover, with considerable pain in the lower part of the belly; and at length was incapable of passing a motion by any means. The real cause of the disease not being very clearly suspected, the strongest purgatives were given to him, both by the mouth, and in the form of clysters, as five grains of calomel and ten of gamboge; ten grains of calomel and thirty of jalap; and at one time four grains of elaterium, which made him sick, but produced no other effect. Two drachms of gamboge were given in the form of an injection, and afterward tobacco-smoke, but altogether in vain; as were also draughts of

* Trans. of a Society for Med. and Chir. Improvement. See also a case, very similar in every particular, reported by Mr. Sterry, in the London Med. Repository for May, 1823.

crude quicksilver by the mouth, shocks of electricity through the abdomen, and the affusion of cold water on the feet. His appetite was but little interfered with, and he passed water freely. A scoop was introduced into the rectum, but this gut was found empty. Under this state of things the belly swelled gradually, and at length arrived at an enormous size, and the patient died in the fifteenth week from the last evacuation. An examination after death showed the real nature of the cause; for at the lower end of the sigmoid flexure of the colon there was a narrow stricture, which would hardly admit the passage of a goosequill, accompanied with an ulcer, which was partly in the situation of the stricture, and partly in the gut above it. This intestine was peculiarly loaded with feces, and enormously distended; the mean of the transverse diameter being above six inches. All the large intestines, where the distention was considerable, had their muscular coat a good deal strengthened, and the longitudinal bands had become twice as broad and thick as in their natural state; the system thus wonderfully accommodating itself, for many weeks, to circumstances which seemed incompatible with the continuance of life. [This case demonstrates the value of the advice given by Willan, respecting the use of a long bougie, as mentioned in the observations on colica constricta.]

The effects of constipation, when long continued, are, pains in the head, nausea and sickness at the stomach, febrile irritation, general uneasiness in the abdominal region, congestion in the abdominal organs; and hence an impeded circulation of the blood, piles, varices in the lower limbs, and, as we have already seen, colic. [Many hysterical affections, chlorosis, and chorea, or St. Vitus's dance, formerly supposed to be unconnected with the state of the bowels, are now proved to be very prejudicially influenced, if not excited by constipation. Even symptoms bad enough to cause the case to be set down as phthisis, and the patient to be sent to Madeira, were ascertained by Dr. Borthwick to arise from habitual costiveness, and to yield to purgatives.]—(*Edin. Med. Journal*, No. 82, p. 69.)

The best aperients, in the present species of costiveness, are those which quicken the descent of the feces with as little increased action as possible; as diluent drinks sweetened with manna, sugar, or honey; the expressed oils of mild vegetables, as the pistachio, olive, and almond; the oleaginous farina of the cocoanut in the common form of chocolate; figs, tamarinds, the pulp of cassia alone, or in the compound of lenitive electuary; neutral salts. Dr. Arbuthnot advised the use of butter, marrow, and fat. Dr. Cullen found four ounces of fresh butter, taken in the morning, produce a stool or two more than usual in the day. Nauseating doses of calomel and ipecacuanha, or of calomel and antimonial powder, will also frequently be of use; and the patient should habituate himself to evacuating the bowels at a certain hour of the day, and should even accustom himself to an effort to this effect, though he may not always be successful. And where this milder process fails, the more powerful purgatives must be had recourse to.

In some instances of very great difficulty, and of an anomalous kind, an affusion of cold water has been accompanied with great success after all common cathartics, quicksilver in its metallic state, antimonials of various kinds, and injections of every sort have been tried in vain. Two striking examples of this occur in a letter from Dr. Spence of Guildford to Dr. Reynolds, published in the Med. Trans. of the College.

[By Dr. Daniel, charcoal was found an efficacious remedy. The dose was from one to three tablespoonfuls, given in lime-water, or milk, every half hour or hour.—(*Philadelphia Journal*, No. 9, p. 119.) Spirit of turpentine, in the dose of half an ounce, mixed with an equal quantity of oleum ricini, has also succeeded.—(*Edin. Med. Journal*, No. 85, p. 307.)

Instead of adopting the latter plans, the generality of modern practitioners would administer the oil of croton, a very minute dose of which has great power in relieving obstinate constipation, when other cathartics, even in large and repeated doses, have no effect. Mr. Iliff has reported fourteen cases, in which its usefulness was most decidedly proved.—(*Lond. Med. Repository*, No. 97.) The average dose for an adult is one, or at the utmost, two drops; and, perhaps, as Mr. Brande observes, the best, or at least the most active form for its exhibition, is that of a pill made up with crumb of bread. It may also be rubbed down with mucilage, and mixed with half an ounce of any aromatic water.—(*Manual of Pharmacy*, p. 183.) However, according to Mr. Pope, the best mode of administering the oil is to dissolve it first in a little alcohol, in the proportion of about one drop to half a drachm, in which state it may be more easily diffused in some simple fluid; and, by acting on an extensive surface, the purgative effect, he says, is more speedily ensured. The alcoholic tincture, recommended by this gentleman, has been given very successfully to children.—(See *Med. Chir. Trans.*, vol. xiii., p. 99.) In numerous instances of difficult deglutition, the simple application of the oil to the tongue has answered the purpose. When the stomach is so irritable as not to bear ordinary cathartic medicines, the oil of croton is also a valuable remedy. It has sometimes been given in clysters, in which form the dose may be five or six drops.* In one very obstinate case, suspected

* The croton-oil is now much used by American practitioners in cases of obstinate constipation. After ordinary depletion by the lancet, which will often prove serviceable, and other general relaxing means, the croton-oil may be given in doses of one or two drops every two or three hours, to a very considerable extent. We have given it to the amount of twelve drops, with no other effect than that of producing a moderate action of the bowels. In a case of this disease which had existed for fourteen days, and had resisted the most approved remedies, Dr. J. W. Francis used the croton-oil to the extent of twenty drops, given in doses of two drops every three hours; the patient was relieved without any of the bad consequences

to depend upon introsusception, Dr. Chisholm employed with success a strong solution of common yellow soap, of which more than a large wash-hand basin was gradually but perseveringly thrown into the large intestines with Read's syringe.]*

SPECIES II.

COPROSTASIS OBSTIPATA

OBSTIPATION.

THE FECES, WHEN DISCHARGED, HARD, SLENDER, AND OFTEN SCYBALOUS; THE TEMPERAMENT WEAKLY, OR THE HABIT SEDENTARY.

THIS is in most cases the result of a sluggishness of the peristaltic motion in persons of infirm or delicate health: in consequence of which, the refuse matter of the aliment, usually small in quantity, is a long time passing through the intestinal tube, and hence becomes indurated, shrunk, and shrivelled, so to speak, by the length of time it is exposed to the power of the intestinal absorbents, notwithstanding they may have no such increased action as occurs in the preceding species. This form of costiveness is most frequent in persons of advanced life; in whom the feces, minute in quantity, and deprived of moisture, are sometimes discharged in the form of a scroll, and sometimes in small lumps, of the shape of buttons or balls, as I have already observed when treating of *colica constipata*; which affection also, as there remarked, is often produced by the irritation that these retarded materials at length excite. So feeble, indeed, is the expulsive power of the intestines in many cases of old age, that it is sometimes necessary, as recommended by Dr. Warren, to introduce a sort of marrow-spoon up the rectum, for the purpose of bringing away the dry masses that have lodged there.

[When a large accumulation of feces takes place in the rectum or colon, it becomes itself the cause of a most distressing constipation, attended with peculiar symptoms, and sometimes terminating fatally. The disorder was first described by an anonymous writer (*Med. Obs. and Inq.*, vol. iv., p. 123), and additional cases of it have been subsequently reported.—(*Duncan's Med. Comment.*, vol. x., p. 255; vol. xii., p. 282.) It is the more important to attend to this complant, because it assumes the appearance of a diarrhœa, or rather a chronic dysentery, and has often been erroneously treated with astringents and opiates. The patient complains of severe pain about the lower region of the belly, remitting, and again returning after frequent but short intervals, and accompanied with a bearing down, and almost continual inclination to go to stool. Only a small quantity, however, of thin discharge, perhaps mixed with little hard knobs of excrement, follows, after which the pain abates. When, from a previous costiveness, and the abovementioned symptoms, the loaded state of the rectum is to be suspected, this bowel should be examined *per anum*, and the feces broken down and extracted with some convenient instrument. The accumulation that takes place is sometimes very great. This case is frequent in persons of advanced age, and more frequent in the female than the male sex. Whatever tends to lessen the peristaltic motion of the bowels must induce a predisposition to it; and it has been often occasioned by the long-continued use of bark, opium, and other astringent medicines.]—(*Bateman, in Rees's Cyclopædia*, art. CONSTIPATION.)

It sometimes happens, however, that a contrary temperament prevails in old age; that the bowels are irritable, and the motions loose. Celsus (*Medicin.*, lib. i., c. 3) has laid it down as a maxim, that when the bowels are loose in youth, they commonly become confined in advanced life; and that if confined in youth, in advanced life they are often laxative. Quibus juvenibus fluxit alvus, plerumque in senectute contrahitur; quibus in adolescentia fuit adstricta, sæpe in senectute solvitur. I cannot say that I have been able to confirm this position by my own observation or experience.

In costiveness from this cause, our aperients must be derived from other materials than those recommended under the last species; for here we have far less reason to be afraid of the warmer and aromatic purgatives. And hence, while we allow a freer use of wine, we may successfully have recourse to aloes, the compound pill of this name, and the balsam of copayva.

The analeptic pill of Dr. James, which combines a preparation of antimony with resinous purgatives, is often a very serviceable medicine: as is also the form recommended by Dr. Parr, which consists of half a drachm of the gum-pill, the same quantity of the pilula aloes cum myrrhâ, with ten grains of antimonial powder, made into fifteen pills.

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which are sometimes ascribed to this powerful agent. Dr. Chapman, of Philadelphia, has advised, in formidable cases of this affection, injections of starch or mucilage, containing from four to eight grains of tartar emetic. Dr. Hosack (*Essays*, vol. ii,) has published the details of several cases, which were treated successfully by emetics. From the sixteen which he has witnessed, he concludes:—1st, That in the commencement of constipation, or in its more advanced stage, when the symptoms of inflammation have been subdued by the lancet, emetics may be used with advantage to remove the hepatic obstruction, and to counteract the constriction and pain usually attendant in this disease. 2d, That the good effects occasionally resulting from injections of tobacco-smoke, or from the use of tartarized antimony, administered by injection, may be accounted for by the nausea and vomiting which have been the effects of its operation, but which are to be obtained with more certainty by administering emetics.—D.

* Med. Repository. The particulars of a case of obstinate constipation were lately communicated to the editor, where a practitioner in the country determined to attempt to draw out the contents of the intestines with a syringe; but instead of succeeding, he contrived to force an enormous quantity of air into the bowels, and to make his patient swell like a balloon when receiving gas. In this condition, the patient was left scarcely able to respire. The blunder was obvious to the family, and the doctor dismissed.—ED.

GENUS VIII.

DIARRHŒA.

LOOSENESS.

THE ALVINE EVACUATIONS CRUDE, LOOSE, AND TOO FREQUENT; WITH LITTLE OR NO GRIPING OR TENESMUS.*

Of all the specific forms of this disease, the chief proximate cause, as it is called, or the symptom that gives rise to all the other symptoms, is an increased peristaltic action throughout the whole or a great part of the intestinal canal: and as this may be produced by various means and under different circumstances, it must often stamp a peculiarity in the character of the disorder, and lay a foundation for numerous species.†

The peristaltic action of the intestines may be increased, and consequently looseness or diarrhœa occasioned, firstly, by irritating materials thrown into them by the mouth; secondly, by a morbid change in the fluids which are naturally secreted in the intestinal canal; and thirdly, by an irritable state of the intestines themselves, or the membrane that lines their inner surface. Independently of which, the same effect may follow, in a variety of ways, from the readiness with which the intestines associate in the action of remote organs. Thus sudden passion or commotion of mind will frequently excite looseness; sudden cold or heat applied to the surface of the skin will do the same. [And among the diseases of other parts of the body which affect the intestines, the irritation of dentition in infants may be mentioned as a familiar illustration; as it is seldom difficult, without producing diarrhœa. The

* "Pain, or griping, is occasionally an attendant, but not necessarily so."—(Drs. Crampton and Forbes, in Cyclop. of Pract. Med., art. Diarrhœa.) Professor Elliotson's definition of diarrhœa is, "frequent, liquid, and rather copious feculent stools, not dependant upon debility of the sphincter ani." In dysentery, the stools are not feculent. In diarrhœa, "there is only pain at the time of the evacuation; but in dysentery, the griping is horrid, and is not lessened by the discharge of mucus and blood, which characterizes the disease."—(Lectures in Med. Gaz. for 1832-3, p. 593.)—Ed.

† Perhaps, instead of representing increased peristaltic action as the proximate cause, it would be more correct to say, that the essential part of this disease consists in a preternatural augmentation of the peristaltic motion, and of the intestinal secretions; the predisposing causes being a peculiar irritability of the intestines, and of their secerning vessels. To call increased peristaltic action the proximate cause must be inaccurate, since it exists in several other cases never comprehended under the name of diarrhœa. As a general rule, Drs. Crampton and Forbes join the best modern pathologists, in considering the seat of diarrhœa to be the intestinal mucous membrane: "and it is the state of this membrane, and not the discharge, which is to be regarded as the great object of attention. The only exceptions to this rule are the cases where the disease is excited by fluids poured into the intestinal tube from the annexed glands, or by irritants of a temporary kind, as food or medicines, applied directly to the membrane. Even in these cases, the secondary affection of the membrane is often of much more importance than the cause producing it." In the mildest forms of diarrhœa, it is conceived that a degree of irritability may exist in the mucous membrane. In another variety, there may be a morbid degree of excitement, or of increased action in the membrane, considered as a secreting and exhaling organ, whereby it throws out its fluids in a morbid state or quantity, or both. But in a still more numerous class of cases, more or less inflammation of the mucous membrane prevails, from simple slight congestion to alteration of structure. It may be confined to a small portion of the intestinal tube, or it may extend over a large portion of it. In this form of diarrhœa, the evacuations deviate greatly from the character of health, and consist principally of fluids secreted by the inflamed membrane being mucous, or serous, or flaky from admixture of coagulable lymph, and variously coloured, according to the condition of the liver, the ingestion of food, the previous treatment, &c.—(See Cyclopædia of Practical Medicine, art. Diarrhœa.) According to the researches of Andral, dysentery, diarrhœa, and lientery, are far from being constantly associated with one particular state of the alimentary canal. The changes observed in it after death are most commonly situated in the large intestines, sometimes affecting every part of them, sometimes only certain portions of the tube. Occasionally the cœcum alone is diseased; in other instances, the rectum. The whole of the small intestines may continue sound, and the abruptness with which the marks of disease often begin to show themselves immediately below the valve of the cœcum, is a remarkable fact. On the other hand, sometimes no vestiges of disease are found in the large intestines, and the termination of the small ones is the only part affected. Most commonly, both the lower end of the ileum, and a more or less extensive portion of the larger intestines, are the seats of alterations, which differ in kind from a mere vascular fulness to the most complete ulceration, or softening of texture. Neither do the morbid appearances bear any constant relation to the duration or symptoms of the disease; for, in a given number of subjects, as nearly as possible similarly circumstanced in the two latter respects, we may find in one only a simple hyperæmia; in another, a softening of the mucous membrane with redness; in a third, a pale softening of the same texture; in a fourth, an induration of it with various shades of colour; in a fifth, an enlargement of the follicles, without any other morbid appearances; in a sixth, ulcerations, varying in number and size; and, in a seventh, together with one or another of these affections of the mucous coat, different morbid conditions of the other tunics, such as thickening, infiltration with serum, &c. Even the symptoms fail to denote the particular kind of alteration that may exist in the intestines, and the very same morbid appearances sometimes occur in subjects who have had a serous, or bilious looseness, as are met with in other cases, where the assemblage of symptoms constitute dysentery. Frequently there is an entire absence of fever and pain, when the mucous coat has numerous ulcerations in it, surrounded with a red, brown, or black thickening of that texture. In a few examples, dissection reveals no morbid appearances whatever, and affords no explanation of the functional disorder. Then there are certain diarrhœas arising from a morbid secretion produced out of the intestines themselves, but passing through them to be discharged.—Andral, Précis d'Anat. Pathol., t. ii., p. 204.—Ed.

sympathy between the skin and the bowels is particularly great in many individuals, so that exposure to damp or cold air, or wetting the feet, will generally bring on a diarrhœa. Looseness of the bowels is frequently attendant on measles, scarlatina, and other exanthemata. In these last examples, an excited or inflammatory state of the mucous membrane accompanies the disorder. Diarrhœa is also a frequent and a most dangerous assailant in the advanced stage of a great variety of diseases, as fevers, phthisis,* chronic hepatitis, lumbar abscesses, diseased joints, &c.; completing that prostration of strength usually seen a little before their fatal termination.] But as all affections of this last kind are evidently cases of mere sympathy, they must be excluded from the history of diarrhœa considered as an idiopathic disease; and even in their treatment can only be remedied by remedying the primary complaint. [Cholera and dysentery often commence in the form of diarrhœa.]

The subdivisions of diarrhœa may be resolved into the seven following:—

1.	Diarrhœa Fusa.	Feculent Looseness.
2.	——— Biliosa.	Bilious Looseness.
3.	——— Mucosa.	Mucous Looseness.
4.	——— Alba.	White Looseness.
5.	——— Lienteria.	Lientery.
6.	——— Serosa.	Serous Looseness.
7.	——— Tubularis.	Tubular Looseness.

SPECIES 1.

DIARRHŒA FUSA.

FECULENT LOOSENESS.

THE FECES OF COMMON QUALITY, BUT IMMODERATELY LOOSE AND COPIOUS.

THIS species generally works its own cure without the aid of medicine; for its common cause is food eaten to excess, or intermixed with an undue proportion of irritating materials, saline, saccharine, or vinous; in consequence of which it passes rapidly, and not thoroughly digested, from the stomach, and urges the intestines to an undue degree of activity. Hence often, antecedently to the looseness, there is a sense of sickness, and perhaps a few slight torminal pains. But if the disorder do not prove its own remedy, it is easily removed by any common purgative. In weakly stomachs, or where the intestines are sluggish, this mode of diarrhœa is also occasionally produced by a retardation of the aliment, till it irritates from acescency, putrescence, or superabundant accumulation; and where it is not checked in due time, it will occasionally, like several of its cognate species, run into a chronic form, and prove extremely troublesome and obstinate. In some cases it has lasted for two (*Riedlin*, cent. iii., obs. 90), and even for three years (*Forestus*, lib. xxii., obs. 3), and it then requires to be restrained with caution; for a sudden transfer to a state of costiveness has often produced some other severe complaint. And the same remark may be applied to the diarrhœa that occurs during dentition, which ordinarily keeps off febrile irritation; and, when violent, should be moderated, but not subdued.

This species is also produced occasionally by sudden exposure to cold, and especially by cold bathing; by great agitation of mind, and particularly that of fright, or anger, sometimes even when those passions have merely existed in dreaming (*Ephem. Nat. Cur.*, dec. i., ann. iii., obs. 234); and occasionally also by the bare sight of a purgative or other medicine which the patient is reluctant to swallow. All these are instances of sympathetic action, which has sometimes shown itself in perhaps a still more extraordinary way, where there has been a peculiar irritability of habit. Thus Borrichius relates a case in which it was produced by introducing a globule of black hellebore into an issue in the arm.—(*De Qualitat. Occultis*, 1715.) [In certain individuals this idiosyncrasy is so strong, that particular articles of food quite inoffensive to the generality of people will invariably bring on diarrhœa. The complaint is frequently produced by a sudden change of diet, as from an animal to a vegetable one; or by a change of the water, or bread, to which we have been accustomed. In this species of diarrhœa, as indigestion and crudities in the stomach are frequently the cause of the complaint, emetics have often been found serviceable. But purging has been supposed to be still more necessary to remove the crudities that have passed into the bowels. The celebrated Cullen believed, however, that this practice is founded on very erroneous notions. It rests upon the supposition of an acrimony present in the intestines, that ought to be carried out by purging. But from whatever source the acrimony proceeds which can excite a diarrhœa, it may be considered, he says, sufficient to evacuate itself, so far as that can be done by purging. Dr. Bateman pronounces this opinion extremely rational, and observes, that when merely opposed to the indiscriminate use of purgatives in diarrhœa, its justness is undeniable. But he believed that Dr. Cullen, in avoiding one extreme, gave a sanction to another. In a recent case of idiopathic diarrhœa from excesses at table or cold, a gentle purgative is seldom, if ever, in the slightest degree hurtful. However plausible the supposition that the irritating matter in the bowels will invariably purge itself off, experience proves that it is frequently very imperfectly voided, and that a part of it remains behind, keeping up a degree of irrita-

* The diarrhœa generally occurring in the latter stages of phthisis, depends on ulceration of the mucous membrane. The ulcers are sometimes very numerous, and scattered over the greater part of the intestinal canal: at the extremity of the ileum, however, they are more commonly found than in any other situation.* On this subject valuable information is contained in the works of Andral.—ED.

* Dr. Stokes, of Dublin, in his Lectures on the Theory and Practice of Physic, alludes particularly to this fact, and states that a blister applied to the abdomen will often arrest diarrhœa in phthisical patients, when other remedies have been used without success.—D.

tion often continuing the disease, and even converting it into dysentery. Whenever any material degree of tenesmus is observed, a purgative is generally indicated; and if the bowels be very irritable, opium may be combined with it.*—(Art. Diarrhœa, *in Rees's Cyclopædia.*) In these cases, calomel and ipecacuanha, calomel and rhubarb, or rhubarb with the tinctura or confectio opii, are invaluable medicines. When the case resists these medicines, small doses of the chalk mixture, with the tinct. catechu, the compound powder of kino, and tinct. opii, may be exhibited; and in very long protracted, unyielding examples, the camphire mixture with nitrous acid and opium,† or the sulphate of copper joined with opium, may be given twice a day, in the dose of half a grain, gradually increased to that of a grain and a half, as recommended by Dr. Elliotson.—(*Med. Chir. Trans.*, vol. xiii.) In every form of diarrhœa, the diet is a most important consideration: it should consist of milk, rice, arrow-root, tapioca, sago, jelly, beef-tea, or broth. In particulra, all malt liquor should be avoided, and weak brandy and water, wine and water, or barley-water, preferred.‡]

SPECIES II.
DIARRHŒA BILIOSA.
BILIOUS LOOSENESS.

THE FECES LOOSE, COPIOUS, AND OF A BRIGHT YELLOW.

From the highly bilious tincture of the dejections, there can be no doubt that the bile, in this species, is secreted in a greater quantity than usual, and perhaps with an unusual degree of pungency; and hence the excess of peristaltic activity.◊

The most common remote cause of this species of diarrhœa is a great and sudden increase in the temperature of the atmosphere, or a less than its mean degree of heat, operating for some weeks or months. Dr. Lind has justly remarked, that a rapid change of climate, whether from a colder to a hotter, or from a hotter to a colder state, is equally apt to excite diarrhœa. But the complaints hereby produced are of very different characters. That occasioned by sudden cold consists of an acrid mucous discharge, and will be treated of and explained under the next division. The diarrhœa excited by passing rapidly from a cold into a hot climate, belongs to the division before us, and depends upon an increased secretion of bile of bad quality. The calorific rays of the sun exercise a peculiar influence upon the organ of the liver, and soon stimulate it to an augmented action. In the intertropical regions, the quantity of bile hereby secerned is even more than the bile-ducts can conveniently carry off; whence some portion of it retrogrades, and is carried by absorption into the system, and is one of the causes, though not the only cause, of the darker hue of the skin in those quarters. In our own country, this species of diarrhœa is therefore found most commonly in the earlier part of the summer, when suddenly and vehemently bursting upon a cold spring; or in the autumn, when the liver has for many weeks been exposed to the effects of a very vigorous sun, and the whole system has become relaxed and debilitated. If at this time the atmosphere be pure, the disease is simple, and may be subdued without much difficulty; but if the rays of the sun should carry off the greater part, but not the whole, of the stagnant water from the fens and marshes of a country, and convert them into corrupt and offensive swamps, the atmosphere will be loaded with an effluvium of decomposed organized matter, animal or vegetable, or both, and the simple bilious diarrhœa will be converted into a remittent bilious fever; and hence, in few words, the common origin of the bilious autumnal fevers that so frequently prevail at the close of the summer season.

When the bilious diarrhœa is simple and unconnected with fever, it is seldom a formidable disease: a few doses of calomel, with a view of emulging the bilious pores of the liver, correcting the irritation of the organ, and taking off its increased action, with the assistance of mild diluents and demulcents, as infusions of lin-

* In cases of diarrhœa, the abdomen should always be swathed with flannel; warm fomentations also are sometimes useful.—D.

† ℞. Acidi Nitrosi dilut. ʒj. Misturæ Camph. ʒvlij. Tinct. Opii guttas xl. Cochl. magn. iv., quarta quaque hora sumend. Recommended by Mr. Hope in Edin. Med. Journ., No. 88. At the Bloomsbury Dispensary, a very efficient medicine for checking the diarrhœa which occurs in the fruit season, is found to be the camphire mixture, with ten grains of the subcarbonate of soda, and one drachm of the tincture of capsicum to each dose.—Ed.

‡ In the treatment of every diarrhœa, the first thing is to inquire into the cause. When the mucous membrane of the bowels is in a more or less inflamed state, and there is tenderness on pressure, as is illustrated in the diarrhœa of measles, diluents, astringents, and opium will not answer, unless leeches and a blister be applied to the abdomen. When the exciting cause is improper diet, this must be changed.—Ed.

◊ This diarrhœa is not necessarily attended with any morbid change in the intestines, in which nothing but an unusual quantity of bilious matter is detected by dissection. The disorder, as Andral observes, is here brought on by a morbid secretion, not produced in the bowels themselves, but taking its course through them, in order to be discharged. When it is removed, the subjacent mucous coat is found quite unaltered, and its vessels scarcely more injected than natural. The source of the complaint, as well as of certain kinds of constipation, is in the liver. Every preternatural flow of bile into the intestines, then, is not invariably the effect of some irritation first existing in them. Other organs in the neighbourhood of the alimentary canal may accidentally communicate with it, and pour into it their different secretions, healthy or unhealthy. Thus, Andral has seen three cases, in which a purulent diarrhœa was kept up by the matter of ovarial abscesses passing through ulcerated openings into the rectum; and an interesting fact of the same kind is recorded by M. Dalmas.—See Andral, Anat. Pathol., t. ii., p. 206, and Journ. Hébd. de Méd., Nov. 1828.—Ed.

seed, quince-seeds, or comfrey-roots, for lubricating the intestinal canal, which has participated in the irritation, will usually prove a successful practice. The last was at one time a popular medicine in diarrhœas, and Dr. Cullen objects to its being omitted in the Materia Medica of the colleges. If the flux, and consequently the excitement of the liver, should still continue, opiates may be employed with advantage.

SPECIES III.
DIARRHŒA MUCOSA.
MUCOUS LOOSENESS.

THE DEJECTIONS CONSISTING OF, OR CONTAINING, A COPIOUS DISCHARGE OF MUCUS.

THIS species bears a striking resemblance to the defluxion from the nostrils in catarrh. Its common cause is cold, particularly in the feet; the motions are acrid, often with but little bilious tinge; and like the nostrils in a catarrh, the lower part of the rectum is excoriated. It is hence denominated by many writers *catarrhus intestinorum*, and by Dr. Boerhaave *diarrhœa catarrhalis*.

The disease is, perhaps, also sometimes produced by acrid ingesta, as a coryza is occasionally excited by sternutatories in those not accustomed to them. Here the process of purging will rather add to the complaint than diminish it; and copious diluents and demulcents afford the most rational mode of treatment; with which plan the daily diet should be made to coincide.*

This species of mucous or catarrhal diarrhœa, like the two preceding, is also frequently produced by any sudden change in the temperature of the atmosphere from great heat to great chilness; and hence its frequency and severity in passing rapidly from a warmer to a colder climate, as into the North Seas in the summer time. "In the outward-bound passage of the vessels in the whale-fishery on the coast of Spitzbergen," says Mr. Macartney Ross, "I have more than once had occasion to remark the very great effect of a transition into a cold latitude in deranging the state of the alvine discharge. The vessels destined for this often perilous voyage, generally leave England about the end of March, when the weather is comparatively temperate. A week or two serves to convey them within the Arctic Circle, in the course of which time few cases are beginning to appear. But after being fairly within the limits of the Frozen Sea, and encompassed with ice, so that the wind even carries with it a strong and penetrating frost, the cases daily increase, both in number and severity. The weather becoming progressively milder after the beginning of May, and the seamen by this time being more inured to the climate, few or no cases are met with; and such as do occur, I have always found to arise from the patient having been called suddenly from bed in the course of duty, and exposed to an intensely freezing atmosphere."

Where the looseness, of whatever species, is produced by a sudden chill on the surface, small doses of ipecacuanha, with or without opium, have generally been given with advantage.—(*Toze*, Bibl. i., p. 118.) Fernelhuys (*An omni alvi fluxui radix Brasiliensis?* Paris, 1706) and Dr. Fothergill (*Med. Obs.*, vol. vi., art. 18) recommend it alone; Dr. Stoerck (*Klin. und Anat. Bemerk.*, p. 7), with more reason, in combination. And if the disease should become chronic, the warmer astringents should be had recourse to, as columbo,—to which also Dr. Stoerck recommends an addition of laudanum,—cusparia, and arnica (*doronicum pardalianches*, Linn.), which, though rejected in our own country, maintains its reputation all over the continent. Of the arnica root, Dr. Stoll used to give a drachm every two hours.—(*Mat. Med.*, part ii., p. 307; part iii., p. 163.)

SPECIES IV.
DIARRHŒA ALBA.
WHITE LOOSENESS.

THE DEJECTIONS MILKY, OR RESEMBLING IN THEIR APPEARANCE A MIXTURE OF WATER AND LIME, WITH A FROTHY SCUM.

[IN the preceding editions of this work, the learned author described two species under the names of diarrhœa chylosa and diarrhœa gypsata. The first is the case denominated in Cullen's Nosology, "diarrhœa cœliaca, quâ tumor lacteus, specie chyli dejicitur." The appellation of chylous looseness, had it been merely used as a simile, would have been but of little consequence; but, promulgated as it has been by various experienced physicians, and even by Dr. Good himself, as derived from the really chylous nature of the excrement, it becomes a vehicle of error, and the judgment of the practitioner in the sick-room is too apt to be blinded by it.]

The colour of the stools, according to Dr.

* On this disease Dr. Stokes remarks, that the most efficacious remedies are the metallic astringents and the turpentines and balsams, combined with some of the preparations of opium: in severe cases of this gleety discharge, he uses the acetate of lead in free and repeated doses, and he has continued this remedy for six weeks without any apparent injury. He has used turpentine also with good effect. The same gentleman has recently drawn the attention of the profession to a form of chronic diarrhœa, occurring in persons of broken down constitution, or in those who have taken mercury freely. It is caused by small ulcers situated close to the verge of the anus; these produce irritation in the colon, tenesmus, griping, and frequent evacuations. The successful treatment of this form of disease consists in touching the ulcers with the nitrate of silver. Dr. Stokes recommends the anus to be examined in every case where the diarrhœa has been of long standing—has resisted a great variety of treatment, is combined with tenesmus, and a desire of sitting on the night-chair after a stool has been passed, showing irritability of the lower part of the large intestine; and, lastly, when the health of the patient does not appear to be so much affected, as it naturally should be where the intestine is much diseased.—(See Lond. Med. and Surg. Journal, March, 1834.)—D.

Good, affords evident proof, firstly, that the bile, which gives the usual tinge to the feces, is either not secreted, or impeded in its flow into the intestines; and, secondly, that the food, after being converted into chyle, is not absorbed and carried into the system.

The non-absorption of the chyle must proceed from some mischief in the lacteals or mesenteric glands; which may either labour under such an inertness or torpitude as to render them incapable of carrying on their proper function, or may be so obstructed in their course as to be prevented from exercising their function, notwithstanding their being in a state of health.

[Dr. Rummel (*Hufeland's Journal*, June, 1825) has taken an excellent survey of the various descriptions of this supposed disease given by authors, and ably exposes the mistake they all committed in believing that there was such a disease as diarrhœa chylosa, the existence of which he completely disproves. It is to Dr. Graves of Dublin, however, that the profession in this country is under particular obligations, for his judicious notice of the erroneous doctrines broached concerning the white forms of diarrhœa.—(See *Dublin Hospital Reports*, iv., 46, &c.) A gentleman applied to him, after having suffered a good deal from an epidemic dysentery. The febrile symptoms and discharge of blood had ceased for many weeks; but the emaciation and weakness continued to increase. He had one or two natural stools daily, without tenesmus; but in the course of every twenty-four hours he experienced eight or ten sudden calls to stool, attended with an impossibility of resisting the bearing down and weight felt in the rectum. Each evacuation consisted merely of two or three table-spoonfuls of muco-gelatinous matter, which varied in colour and consistence, but generally resembled thick milk, or a puriform fluid, and occasionally a transparent jelly. This fluid was evidently a secretion from the mucous membrane of the rectum in a state of irritation or chronic inflammation. It is observed by Dr. Graves, that such a condition of a mucous membrane constitutes the disease denominated chronic blennorrhœa; and, when it occurs in the rectum, produces a disease which, on account of the white colour of the discharge, would formerly have been called fluxus cœliacus, and the evacuation attributed to the loss of chyle by stool; for the chyle was supposed to be formed, but not absorbed, or carried into the system. As Dr. Graves very properly remarks, it is even less surprising that Dr. Good should have retained the old species, diarrhœa chylosa, than that he should have inserted a new one whose existence rests upon still more doubtful evidence. This new species he named diarrhœa gypsata, in consequence of the evacuations resembling in their appearance a mixture of water and lime, which appearance he actually fancied to depend upon the presence of earthy particles in the fluid discharged. This view of the subject he also fortified by several ingenious but premature reflections on the power of animals to secrete lime, and especially on the presence of lime in the intestinal calculi.

Unfortunately, the main and essential proof of the existence of lime in the motions was wanting, all chymical analysis of them having been neglected. Dr. Graves has often seen stools of the colour here described, and so has the editor of this work, which colour was referable to the absence of bile, and a morbid secretion of white viscid mucus from the intestines. Viscid and whitish discharges from the mucous membranes lining the eyelids, bronchial tubes, urethra, vagina, &c., are, as Dr. Graves observes, extremely common, and depend on a state of irritation similar to that which produces the white and scanty alvine evacuations arising from the mucous membrane of the rectum. It is evident, says he, from the case I have related, that chronic irritation of this part may produce much constitutional disease. When, however, the affection extends beyond the rectum, to the other portions of the large intestines, it occasions symptoms still more urgent. That a similar state of the mucous membrane lining the small intestines may occur, and give rise to a white secretion from its surface, is proved by examination of their contents in persons who die of the East Indian cholera, in many of whom white milk-like stools are observed during life. On dissection, these stools are found to depend on a secretion from the small intestines. The diarrhœa alba, described by Hillary as occasionally epidemic in Barbadoes, probably arises from a similar cause. This latter name, as conveying no erroneous hypothesis, the editor ventures to recommend for all the cases comprised under the heads of diarrhœa chylosa and diarrhœa gypsata in the former editions of this work. It is a name that simply expresses the fact of the white colour of the motion, without involving the reader in any hypothesis respecting chyle or lime being parts of what is voided.

For a description of the disease to which the objectionable epithet gypsata was applied, Dr. Good says:]

I am chiefly indebted to a valuable paper of Dr. Baillie, communicated to the London College, and published in its Transactions.—(Vol. v., art. xii.) "The evacuation," says he, "consists of a matter resembling in its appearance a mixture of water and lime, which is generally very frothy on its surface. When the disease is violent, the discharges are copious and very numerous, of a pale colour and sour smell, and the froth looks like yest. When it changes to a milder form, the evacuations are still more or less pale, but of the consistence of pudding, and do not occur oftener than two or three times in twenty-four hours. The appetite is often good, but sometimes defective. The countenance thin and sallow, but not much emaciated. The pulse varies but little from the standard of health but is rather disposed to acceleration. The tongue is generally covered with a white fur of moderate thickness: the urine of somewhat deeper hue than natural, generally clear, occasionally turbid. An examination of the abdomen discovers nothing unnatural. The bowels are apt to be distended with wind; but there is no tumour, nor sense of pain upon pressure."

The disease occurs most commonly in persons who have resided for a considerable time in a warm climate, or who have suffered from affections of the liver: but it is sometimes met with in persons who have never left England, or been conscious of any hepatic complaint. It takes place more commonly in men than in women, though chiefly so perhaps because men endure the evils of hot climates more frequently than women.

Sometimes there will be a state of amendment, indicating a cure. The motions become figured, and of a darker hue, but rarely of the deep colour of health. This improvement, however, is mostly of only a short duration, and the patient soon relapses into the habit of frothy dejections. Those who are afflicted often live for several years, but the disease continues with the changes just noticed, and they hardly ever fully recover. The mind, as in other diseases of irritable temperaments, seems to exercise some influence; for the symptoms are aggravated, or the exacerbations appear more frequently, under the embarrassments of business, or the agitations of anxiety. Repeated returns of the complaint at length wear out the constitution, and the patient sinks from corporeal exhaustion.

In the case formerly termed diarrhœa chylosa, and supposed to depend sometimes upon obstruction of the lacteals and mesenteric glands, and sometimes upon a scanty supply of bile, Dr. Good recommended the following practice. In the first case, he says, the object is to remove the obstruction, which may be best accomplished by active stimulants, as calomel. In the second, if calomel be given at all, it should be in very small doses; but the common preparations of zinc and iron offer a better chance of success: and the *rheum rhaponticum*, or English rhubarb, being very slightly aperient, and far more astringent than the *rheum palmatum*, a useful medicine in various kinds of looseness from relaxation, may here also be employed to advantage in doses of a scruple taken twice a day; and where a more powerful vegetable astringent is required, we may find it in the leaves and young twigs of the *rhus coriaria*, or common sumach; which, however, are chiefly cultivated in our own country for diers and tanners. The berries possess a like property, and are acid, austere, and cooling. To these medicines may be added blisters, or rubefacients to the abdomen.

[The editor of this work is not inclined to place much reliance on any part of the above practice, except the calomel and blisters. As the disease seems to be connected with a scanty secretion of bile, and a morbid state of the secreting vessels of the mucous coat of the intestines, small doses of calomel or the blue-pill, joined with opium, counter-irritation of the skin of the abdomen, and anodyne or astringent injections, seem to him the most advisable remedies at first; and they may be followed by tonics, and other alteratives, according to circumstances. In particular, the nitrous ether, and tinct. opii, which have been frequently exhibited in the camphire mixture, in many inveterate cases of diarrhœa, with superior effect, should be recollected.]

In the examples characterized by the resemblance of the stools to a mixture of lime and water, Dr. Baillie estimates the influence of medicine as very inconsiderable. Half a grain of calomel, three grains of pilulæ hydrargyri, or a few of the hydrargyrum cum creta, taken every night, or every second night, have occasionally produced some advantage, by stimulating the liver to a better and more plentiful secretion of bile, without impairing the strength of the constitution; and bitters, as cascarilla or cusparia, combined with a few drops of laudanum, have also occasionally had their use. But according to Dr. Baillie, the benefit is often only temporary. [Since the period, however, when this eminent physician wrote his observations, experience has pronounced the sulphate of copper to be a valuable medicine for the relief of this and other forms of obstinate chronic diarrhœa. Dr. Elliotson prescribes at first, half a grain of it twice a day, joined with one grain of opium. The dose is afterward gradually increased to one grain and a half or two grains; and the diet consists of milk, arrow-root, beef-tea, and a little wine.—(*Med. Chir. Trans.*, xiii., 451, &c.)

On the authority of Dr. Rummel, who had employed the extract of nux vomica, Dr. Graves (*Dublin Hospital Reports*, iv., 50) resolved to try the effect of strychnine in cases of diarrhœa alba. One twelfth of a grain was given, in the form of a pill, twice a day, and with a successful result. Dr. Rummel observes, that after endeavouring to remove the original cause of the disease, the best remedies are narcotics, combined with strengthening and astringent medicines. Nux vomica, he says, possesses a peculiar power in controlling blennorrhœa of the rectum. In the cases recorded by Dr. Rummel, he employed sulphate of iron and columbo, besides sulphur, which has a particular action on mucous surfaces. The cure was generally promoted with hyoscyamus or opium, joined with nux vomica.]*

* This form of diarrhœa, the *alba*, is occasionally seen among the inhabitants of some of our southern states, and sometimes succeeds repeated attacks of the bilious fever so prevalent at the south: it often follows also long-continued habits of indulgence in stimulating food, and the abuse of ardent spirits; and occurs likewise in those who are subjected to severe labour, and whose diet is indifferent and unwholesome: in short, those causes which primarily impair the tone and functions of the digestive organs, cause this disorder. The mucous surface of the whole alimentary canal is often affected by this complaint, and the stomach being capricious as to the quantity and quality of the food, its functions become after a while so impaired, that marasmus often ensues. The best treatment, unfortunately, is often unsuccessful; the blue-pill, and the hydrargyrum cum creta in limited quantities, are among the best mercurials. Salivation will inevitably do harm. The slight mercurial doses may be followed by the astringent resinous gums, as the catechu or the kino, blended with chalk and a little camphire in

SPECIES V.

DIARRHŒA LIENTERIA.

LIENTERY.

THE DEJECTIONS CONSISTING OF THE ALIMENT PASSED RAPIDLY, AND WITH LITTLE CHANGE.

The signs entering into the definition of this species prove sufficiently in the first place, that the stomach is in a morbid state, and that the gastric juice is not secreted in a proper quantity or with proper qualities; and next, that the bile is either not duly secreted, or else obstructed in its passage; for were there a free flux of it, the feces, however crude, would display their common yellow hue, which they rarely exhibit. [According to other writers, however, lienteric diarrhœa depends upon a morbid irritability of the stomach and bowels,* whence the food is prematurely expelled from the former organ into the intestinal canal, in an imperfectly digested state; and the bowels themselves being also morbidly sensible, very quickly void whatever they receive. The motions are at the same time loose and liquid, the exhalant vessels and excretories of the mucous glands pouring out an abundant quantity of their respective fluids. The disease is generally accompanied with great weakness of the digestive power, as well as morbid irritability of the stomach.] Lientery (λειεντερια), lubricitas intestinorum, was the name given to this disease by the Greeks, and it is here retained. The Latins, with a loose translation of the term, called it *levitas intestinorum*; and the general idea expressed by both is, that the aliment passes lightly or fleetly along, and with little elaboration by the intestines; whose peristaltic action is at the same time quickened.

[The view taken by Dr. Good of the causes of the present disorder, led him to recommend the general plan prescribed for dyspepsy. According to other physicians, however, the indications are first, to lessen the irritability of the whole alimentary canal, by the exhibition of opium, joined with astringents and absorbents; secondly, to increase the digestive power of the stomach, by the administration of tonic bitter medicines, as the infusion of cascarilla, gentian, or orange-peel, the decoction of cinchona, or small doses of the sulphate of quinine. Moderate exercise, especially on horseback, will tend to re-establish the functions of the stomach; and all cold articles of diet, or such as are difficult of digestion, should be avoided; particularly salads, and other raw vegetables. Dr. Bateman once witnessed a severe attack of lientery, brought on by eating a little ice-cream, when the patient had been previously suffering from indigestion; the enfeebled digestive powers seemed to sink at once, and the food was discharged almost unchanged. When the alimentary canal is in the abovementioned irritable state, the invalid should refrain from exercise immediately after meals.]

SPECIES VI.

DIARRHŒA SEROSA.

SEROUS LOOSENESS.

THE DEJECTIONS ALMOST ENTIRELY LIQUID AND LIMPID.

From the thin fluidity of the stools in this species, Hoffmann hasdescribed it by the name of *diarrhœa aquosa*. It is evidently dependant upon a very irritable state of the excretory vessels of the intestines; and sometimes holds the same relation to the third species, *diarrhœa mucosa*, as the limpid defluxion of an incipient catarrh does to the mucous discharge in which it terminates. Yet the irritation is here much greater than in mucous diarrhœa, often produced by different causes, and frequently requires a different mode of treatment. The mucous diarrhœa, or indeed any of the preceding, may run into it if long continued; for the common cause of the irritation is debility of the excretories. Here again it must be obvious that purging of any kind would be mischievous: and the most effectual plan of success that has occurred in my own practice, has been the use of warm astringents and gentle stimulants or tonics.

The simarouba (*quassia simarouba*) is particularly entitled to our attention, and will indeed be found useful in most of the species of the genus before us; as will also, in many cases, the lopez-root (*lopezia mexicana*), which by Gaubius (*Adversar*) was preferred to the simarouba, and which seems to operate at least as much by tranquillizing the irregular or spasmodic action of the intestinal canal, as by any astringent power it may possess. The *geum urbanum*, Linn., better known by the officinal name of caryophyllata, or herb bennet, was formerly in high repute for all complaints of this kind; its taste is aromatic and austere.

The *punica granatum*, balaustine, or pomegranate-tree, is still continued in several pharmacopœias, and employed in practice in this and the preceding species, both in the flower and bark: the latter seems to have been a favourite medicine with Dr. Mead, who prescribed a decoction of it, with red roses and cinnamon, in various diarrhœas proceeding from debility. Cullen (*Mat. Med.*, vol. ii., p. 44) thinks highly of it. It is indeed a powerful astringent, and as such is entitled to attention; but it has a roughness so unpalatable as to disqualify it for general use. Where these cannot be retained on the stomach,

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the form of a julap. The late Dr. Richard Bayley, of New-York, used freely a decoction of the simarouba. The practice of Dr. Elliotson has long been known among us: and the sulphas ferri in like doses, blended with half a grain or a grain of opium, is also administered as a judicious tonic. We are not aware that any of our practitioners have used the strychnine in this affection.—D.

* Bateman, in Rees's Cyclopædia, art. Lientery. As if physicians were never to agree, it is the opinion of Drs. Crampton and Forbes, that "the variety (of diarrhœa) termed *lientery*, in which undigested aliment appears in the stools, has no claim to be considered as a distinct form of diarrhœa, as the circumstances supposed to characterize it may occur in every species of the complaint."—Cyclop. of Pract. Med., art. Diarrhœa.—Ed.

alum alone may often be given with advantage; and Dr. Cullen expresses his surprise that it is not employed more frequently or more freely. His dose is four grains at first, and afterward a scruple several times a day.*

Where the disease is of very long standing, we often gain great benefit by uniting a tonic or astringent with a diaphoretic, thus strengthening the bowels, while we take off irritation by exciting a transfer of action on the skin. Upon this principle Dr. Fordyce proceeded when he prescribed a combination of tormentil and ipecacuanha. A like transfer of action has sometimes been attempted by issues, blisters, and setons. Hippocrates (Περὶ Παθῶν, lib. iii., p. 523), with more reason, employed for the same purpose emetics, and has been followed by Fontaine, and other practitioners; and Malvachini, with the same view, recommended diuretics.—(*Utiles Collectiones.*) Dr. Lind (*On Diseases in Hot Climates*) and Dr. Adair (*Med. Commentaries*, &c.) have recommended the native carbonate of zinc, or officinal calamine in fine powder.

In a very obstinate case that fell to my lot a few years ago, in which the patient, a young woman of twenty-four, had, for ten years, never passed fewer than nine or ten watery stools a day, sometimes tinged with blood, and often accompanied with great spasmodic pain, I found the disease yield in a few weeks to camphire mixture and pills of the resinous gums, after that, as I had reason to believe, all the usual routine of astringent earths and salts, astringent purgatives and narcotics, had been tried, and spent their force in vain. It is probable that, in some cases of this kind, the superacetate of lead, in doses of a grain, combined with three or four drops of laudanum, might prove equally useful. [Here, also, the sulphate of copper, in the dose of half a grain, gradually increased to a grain and a half, joined with opium, and given twice a day, merits trial, the experience of Dr. Elliotson being strongly in its favour.]

This disease is also occasionally produced by drastic purges, as elaterium; and is often critically employed by nature to carry off dropsies, and some other remote accumulations of fluids

SPECIES VII.
DIARRHŒA TUBULARIS.
TUBULAR LOOSENESS.

THE DEJECTIONS CONSISTING MORE OR LESS OF MEMBRANE-LIKE TUBES, WHITISH, VISCOUS, AND INODOROUS.

I HAVE never hitherto seen this species arranged, and not often described; but it occurs frequently in practice; and appears to depend upon a peculiar irritability of the villous membrane of the larger intestines, which, in consequence, secrete an effusion of coagulating fibrin, fibrin mixed with albumen, instead of secreting mucus, occasionally accompanied with some degree of chronic inflammation. It has a striking resemblance to the fibrous exudation thrown forth from the trachea in croup, but is usually discharged in longer, firmer, and more compact tubes. There is commonly a considerable sense of heat and uneasiness in the rectum; and upon evacuations, the sphincter, partaking of the irritability, contracts so forcibly, that the feces are discharged with great pain and of very small calibre.

From the laminated appearance of this effusion, it has generally been mistaken for a separation of the mucous membrane of the intestines; with which it seems to be confounded by Dr. Simson (*Edinb. Med. Essays*, vol. v., p. 153); but the exudation has no vascular structure, will not bear extension, and loses its form as soon as handled. At the time of writing I have a case of this description under my care, in a lady of delicate habit, twenty-eight years of age, who has been long labouring under a peculiar irritability of the rectum, giving rise to some degree of chronic inflammation, and a forcible contraction of the sphincter on evacuations. She has already discharged this kind of effusion for six weeks, and in tubes so perfect as at first to excite no small alarm in the attendants who noticed it. It is now, in some degree, on the decline, both in quantity and tenacity.

M. Bauer, in his letter to M. de Hahn (*De Morb. Intest.*, Dresd. 1747), gives similar examples; and a like case is described by Spindler, in which the secretion was worked up into a "materia alba, longa, compacta."—(Obs. 45.) It has sometimes assumed the exact shape of the intestine, as though this had cast off a tunic. —(*Act. Nat. Cur.*, vol. v., obs. 126.)

I have said that the discharge in this species proceeds chiefly from the large intestines; and I have seen it so often as to have had sufficient opportunity of determining with tolerable accuracy the part of the canal affected. From a valuable article, however, of Dr. Powell's (*Med Trans.*, vol. vi., art. vii.), it appears at times to take place in the narrower portion of the intestinal tube, as high up, indeed, as the duodenum; for we are told that it was accompanied with acute pain in the epigastric region; that the stomach was highly irritable; and that it was followed by symptoms of jaundice or obstructed bile.

From a small increase in the pulse, and a coating on the tongue, there seems to have been here also a slight degree of inflammatory action, though so inconsiderable that Dr. Powell questions whether there was any whatever; but adds, which my own experience leads me most fully to confirm, that the disease is certainly not "disposed to assume that peculiar irritative quickness of pulse which marks enteritis."

That the affection described by Dr. Powell belongs to the present species, will appear evident from his description of the material evacuated, which seemed "to have formed parts of

* In large doses it occasions nausea, vomiting, colic, and purging: in small ones, constipation. In old diarrhœas, when ulceration of the mucous membrane exists, alum may cause mischief.—See A. T. Thomson's Elem. of Mat. Med., vol. ii., p. 59.—ED.

an extensive adventitious membrane of no great tenacity or firmness."

"In the first of the cases," he adds, "which came under my notice, this membrane was passed in perfect tubes, some of them full half a yard in length; and certainly sufficient in quantity to have lined the whole intestinal canal. In others, also, the aggregate quantity has been very large, and it has continued to come away for many days, but it has been in thin irregular flakes, of not more than two inches extent, and not, as far as I could discover, of the perfect tubular form." And he afterward compares the membranous material thus excreted to that "formed in the trachea, under croup; but the symptoms," says he, "are there more violent and destructive from locality of situation."

From the acute degree of pain which the disease thus situated produced, and must necessarily produce, in the smaller intestines, as also from the spasmodic constriction of the bile-ducts, and the common symptoms of jaundice, the passage of gall-stones was at first suspected, till the character of the intestinal discharge spoke for itself.

From a like effusion of fibrin in the uterus, Blumenbach has shown (*Comment. Soc. Reg. Scientiæ*, Gottingen, vol. ix.) that a tunica decidua has been occasionally produced through the excitement of an aphrodisiac passion alone, without copulation or impregnation; and Morgagni (*De Sed. et Caus. Morb.*, Ep. xlviii. 12) has given examples of so perfect a formation of the same membrane by the irritation that takes place in painful menstruation (*paramenia difficilis*), as to render it difficult to be distinguished from that belonging to an ovum. So corpora lutea have been formed, and their cicatrices occasionally found, in the ovaries of virgins.

The milder preparations of mercury, employed as alteratives rather than aperients, have frequently proved serviceable; and the balsam of copayva still more so. The last is indeed generally useful in a chronic inflammation or irritable condition of the secernents of mucous membranes; and in the disease before us, where I have not been able to induce the patient to take it by the mouth, I have recommended it in the form of injections. In one case in which I prescribed it in this form, three drachms, intermixed with three ounces of mucilage of linseed, being thrown up three times a day, it proved eminently useful.

Common emollient injections, moreover, employed in much larger quantities, where the sphincter will allow the pipe to pass up, afford temporary ease; and a diluent and anodyne injection of warm water and laudanum alone, repeated twice a day, still more benefit. In the meanwhile, the mercurial preparations just adverted to, and especially the blue-pill, or Plummer's, which is still better (the pil. hydrarg. submur. comp. of the London College), should be taken in a dose of four or five grains every night: and, if necessary, the bowels kept open by two drachms of sublimed sulphur daily.*

* Sauvages has mentioned a *diarrhœa adiposa*, in which liquid or solid fat is discharged from the intestines. On this subject the most instructive document is a paper inserted by Professor Elliotson in the last volume of the Transactions of the Medical and Chirurgical Society of London, entitled, "Observations on the Discharge of Fatty Matters from the Alimentary Canal and Urinary Passages." This paper contains, indeed, all that is known on the curious topic to which it relates. Dr. Elliotson begins his remarks by adverting to the formation of ambergris, or gray amber, a fatty substance, consisting chiefly of what is termed ambreine, which is analogous to chloresterine, and supposed to be produced by disease in the alimentary canal of the spermaceti whale (physeter macrocephalus). Some declare that this fatty substance is never seen higher than six or seven feet from the anus, and a mass weighing 182 pounds has been found in the animal.—(Phil. Trans., 1783.) Dr. Elliotson next remarks, that fatty matters, *which have an external origin*, are occasionally discharged from the *human* alimentary canal, and that castor-oil is frequently seen liquid in the evacuations.—(See Riverii Obs. Med., cent. ii., obs. 23, and the German Ephem.) But old authors detail instances of fatty discharges from the intestines, that do not appear to have originated externally; "and (says Dr. Elliotson) of every variety of those old cases I can adduce a modern and indisputable example. In some instances the fat was discharged solid." In a case related by Moellenbroccus, it was not unlike the fat of beef; and in another, recorded by Mæbius, a daily discharge of a substance exactly like human fat occurred. Among other examples, Dr. Elliotson refers to a weaver, whose case is detailed in the Medical Essays for 1752. The matter, voided with his excrement, was a whitish substance, about the bulk of a large walnut, and like tallow or hardened marrow, composed of small globules. For various other instances on record of the evacuation of solid fat, the editor refers to Dr. Elliotson's paper. On other occasions the fat is discharged liquid, and then concretes into the appearance of butter. The learned Professor of Physic in the London University quotes a case of this description from Tulpius.—(Obs. Med. Amst. 1685.) The yellow fatty substance, when thrown into the fire, burnt with a bright flame. He also reminds us of the specimen of such fat preserved in the Museum of the College of Surgeons, and voided by a child four years and a half old. The case was related by Sir Everard Home, as a proof that fat is sometimes formed in the intestines. Dr. Elliotson met with two cases of fatty evacuations, and he has described the appearances found on dissection in these and another example. One patient, a weaver, aged forty-five, was admitted into St. Thomas's hospital, labouring under phthisis and diabetes mellitus. Soon after his admission, he complained of excruciating pain in the abdomen and in the back, and had diarrhœa. In his stools, which were often rather pale, a yellow substance was noticed, like concrete oil. On putting it into the fire, it burnt with a large flame. He continued to discharge more or less of this till his death. Long before, his urine became excessive; it seems that he had voided blood from his bowels, and that as soon as a matter like butter began to pass, the bleeding ceased and pain commenced. The fatty substance was examined by Dr. Prout and Mr. Faraday, who were satisfied of its oily nature. At length the patient grew thin and weak from the combined effects of ulceration of the lungs, the discharge of sugar from the urinary organs, great suffering, and the discharge of fat from the bowels. On examination

GENUS IX.
CHOLERA.
VOMITING AND PURGING.

ANXIETY, GRIPINGS, SPASMS IN THE LEGS AND ARMS, WITH VOMITING AND PURGING, OR FLATULENT ERUCTATIONS AND DEJECTIONS.*

CHOLERA has, by several late and present writers of distinction, been regarded as a mere species of some other genus, as DIARRHŒA, which is the view taken of it by Dr. Young; or as a mere variety of some particular species, as *vomitus*, which is the place it holds in Dr. Parr's nosology. It is not always, however, accompanied with a diarrhœa; and, even where it is so, the constant tendency it evinces to an extensive chain of spasmodic actions, gives a striking character to the disease, and justifies its being arranged and treated of as a distinct genus. From vomitus, it is still more widely discrepant.

The term CHOLERA is of ancient use, for we trace it in the writings of Hippocrates. Celsus derives it from χολη and ῥεω, literally *bile flux;* and Trallian from χολας and ῥεω, literally *intestinal flux*, as though the matter discharged from the alimentary canal were excerned by the intestines rather than by the liver. It is highly probable, that in all its species, we shall have to contemplate the liver as morbidly affected from the commencement, and the bile as some way or other damaged in its secretion, yet not always by too rapid and copious a flow, to which the disease has been generally referred. This, indeed, will be found ordinarily to take place in the first of the three following species; but, in the second, it appears to be injured by suppression rather than by excess; and in the third, by a change in its natural qualities, if, indeed, much of the fluid discharged in this species be not, as suspected by Trallian, in some instances, secerned by the excretories of the intestines.† Under either

after death, all the intestines looked yellow and greasy, as though they had been soaked in oil. Numerous black points were seen in some parts of their mucous membrane, like those frequently noticed after fever and chronic diarrhœa. But no other morbid appearances existed in the alimentary canal. The liver was healthy, and the gall-bladder full of thick, dark bile. The pancreatic duct and the larger lateral branches were crammed with white calculi. The kidneys were sound; the lungs tuberculated and ulcerated.

Dr. Elliotson was shown, by Mr. Pearson of Clapham, a woman who voided both solid and liquid fat. She died of this complaint and phthisis. Her liver was enlarged and painful; her urine scanty and pale; she was generally relaxed, and the evacuations preceded by pain. For many months she vomited several times a day. The feces were very pale, and almost destitute of smell. She passed daily about two ounces and a half of fat, and a third of an ounce of oil; but the quantity of the latter varied considerably. After death no disease was discernible in the alimentary canal or urinary organs. The liver was healthy in structure, but very large and pale, destitute of bile, no less than the gall-bladder, which contained a thick, greasy mucus, not inflammable. In one case, communicated to Dr. Elliotson by Dr. Prout, the cœcum was found much thickened, and the mucous membrane of it and the colon ulcerated.

Dr. Elliotson afterward quotes an example from Tulpius, in which fat was voided both from the bowels and bladder, a modern case of which he has also adduced in a lady of his acquaintance. It seems that Dr. Prout has several times noticed fatty matter that had been passed with the urine, and, in every instance, malignant disease of the kidney and bladder supervened.

"I have thus (says Dr. Elliotson) not merely adduced recent examples of all the old wonderful cases of this kind, and even one example of the most wonderful, in which oil passed from both the intestines and bladder; but have related one more extraordinary than any, in which while *pus*, a substance not found in the healthy body, was passing from the air passages, *oil* was passing from the intestines, and *sugar* from the urinary organs.

"It also appears that organic disease of neither the alimentary canal nor any other part is necessary to the disease, though, in all the cases that have proved *fatal*, and been investigated, there have been found marks of disease in either the alimentary canal, the liver, or the pancreas; and, in many, decided disturbance of the liver occurred during life. The affection, accordingly, has sometimes been temporary, sometimes occasional; sometimes accompanied by various incidental symptoms; sometimes unattended by severe consequences, and sometimes has proved fatal; agreeing in these points with so many other diseases.

"It may be a question whether the fatty discharges from the bowels were derived from the liver or the intestines. The pain at the epigastrium and right hypochondrium experienced in some cases, the jaundice sometimes noticed, the total deficiency of bile in the motions of some of the patients, and the unctuous nature of most biliary concretions, together with the natural presence of unctuous substances in the bile, may favour the opinion of their hepatic origin. I am at a loss to say whether the completely oily appearance of the coats of the intestines, in the man whom I opened, favours the opinion of their intestinal origin. If this is their source, I am at a loss to which portion of the tube to ascribe them.

"In regard to treatment, the lady mentioned by Dr. Babington was always relieved almost at once by a few ounces of olive-oil, and Dr. Simpson appears to have cured two cases by the exhibition of an immense dose of it. In imitation of this practice, I gave my patient two ounces of olive-oil for two successive days, and four ounces on the third, which, however, he made two doses of, with the effect of vomiting and purging; and he certainly from that time discharged much less of the oily matter, and suffered much less pain in the abdomen and back."—See Med. Chir. Trans., vol. xix.—ED.

* Dr. Brown thinks the following definition, which is a modification of that of Dr. Macann, will probably comprise every case really belonging to the genus cholera:—"Vomiting, purging, spasms, prostration, and collapse, or any form of these symptoms occurring simultaneously, or in a succession more or less rapid."—Cyclop. of Pract. Med., art. CHOLERA. This opinion may be correct, especially if the species termed *wind cholera*, by Dr. Good, be put out of consideration. —ED.

† In the spasmodic or malignant cholera here alluded to, the motions have no bile in them whatever, and are perfectly white and watery.—ED.

derivation, however, the term is not incorrect, for the alimentary canal and the liver uniformly co-operate in the morbid action, and the fluid discharged is the result of such concurrence.

Some writers formerly, and many in the present day, have expressed this disease by the pleonastic term of cholera morbus; pretending that cholera, of itself, imports *anger* as well as the disease before us, and that *morbus* is added to distinguish between the two. I am not aware that the word cholera has ever been employed in a mental sense by any Greek writer, though several of its co-derivatives have been. It stands alone in Celsus and Galen; and if a distinctive adjunct were not necessary in their days, it must be wholly superfluous in ours. The following are the species that seem clearly to belong to this genus:—

1. Cholera Biliosa. Bilious Cholera.
2. ——— Flatulenta. Wind Cholera.
3. ——— Spasmodica. Spasmodic Cholera.*

SPECIES I.

CHOLERA BILIOSA.

BILIOUS CHOLERA.

THE VOMITING AND PURGING FREQUENT AND COPIOUS, WITH A REDUNDANCE OF BILE.†

This species is both sporadic and epidemic. Under the first form it is usually of slighter and shorter duration; and its common causes are, superabundant and perhaps acrid bile; suppressed perspiration, particularly by cold or damp applied to the feet, as in standing long on a moist soil in foggy weather; cold drinks, especially when the body is considerably heated by exercise; cold, indigestible fruits, as unripe apples or pears, cucumbers, melons, mushrooms; drastic purges taken in excess; and in one instance an excessive dose of emetic tartar (*Henrici Dissert. de Cholera Morbo*, Hal. 1740); a sudden fright, and particularly from thunder (*Phil. Trans.*, 1667), or any other rapid exhaustion of the sensorial power.

The causes are, therefore, many of them the same as those that produce several of the species of diarrhœa and colic; particularly *colica cibaria*, or surfeit. Sydenham indeed observes, that the symptoms of the last and of cholera are alike, and the cure the same; yet adds that the diseases are of a different kind. In effect, the last is peculiarly distinguished by its wandering, or universal spasticity; and hence becomes a far more dangerous, because a far more general affection.

The epidemic form of the disease shows itself commonly at the close of summer, or the beginning of autumn—Sydenham says, as certainly as the appearance of swallows in the spring, or cuckoos about the dog-days; [and that it very seldom continues longer than the month in which it began. But this observation does not accord with the experience of the present times. Cholera is now seen perhaps more frequently in September than in August; and cases sometimes occur, though it be not epidemic, considerably earlier than August; even in June, or May.—(*Bateman, in Rees's Cyclopædia*, art. Cholera.)] One of the immediate effects of the calorific rays of the sun is to stimulate the liver to excessive secretion of bile; hence the alimentary canal is overloaded with it.* And hence, again, the greater violence of this complaint, and its accompaniment with peculiar symptoms in hot climates. In addition to this cause, however, which operates directly upon the body, there is another which operates indirectly upon the body, and directly upon the atmosphere; and that is, the ascent of an unhealthy effluvium from the decomposition of animal and vegetable substances that form the face of swamps, marshes, and other moist grounds; which predisposes the body to the action of this and other diseases as well; unless it be conceived that the particular epidemy results from a peculiar combination of the decomposing elements, so as to produce a choleric miasm, as, under another combination, they produce a febrile miasm; a subject well worthy of consideration as it relates to the third species of cholera.

It is not to be wondered at, therefore, that this disease should, in many instances, prove excessively severe. Its symptoms, indeed, are often dreadfully violent and rapidly fatal, as may

* For practical purposes, the division into ordinary cholera and spasmodic or malignant cholera, is sometimes deemed sufficient.—Ed.

† "Ordinary cholera may be thus defined:—Vomiting and purging, the discharges during the greater part of the disease containing generally a large proportion of bile; pain in the stomach and intestines; spasms, especially of the muscles of the abdomen and lower extremities, and prostration. If collapse occur, it takes place after the disease has endured some time, apparently as an effect of the great discharge, spasms, and irritation."—(Dr. Brown, in Cyclop. of Pract. Med.) Professor Elliotson's description runs thus:—"At last, however, from the violent pain and profuse discharge, the body becomes cold, great faintness is felt, perhaps there is actual syncope; the patient sinks, becomes excessively weak, and then every thing occurs exactly as if hemorrhage had taken place. General convulsions occur, the spasms cease, and the patient dies as if he had lost an immense quantity of blood."—(Med. Gaz. for 1832-3, p. 600.)—Ed.

* Medical writers disagree on the question, whether in this form of cholera the liver is the part first disordered, or the alimentary canal primarily and the liver secondarily. Dr. Brown considers the first effect of the application of the cause of cholera to be a violent irritation of the mucous lining of the stomach and small intestines, which is then propagated to the liver.—(Cyclop. of Pract. Med.) This view seems to him to be more in accordance with the agency of the usually assigned causes of the disease, with its phenomena, the effects of remedies upon it, and the appearances on dissection. From the latter, perhaps, no inference can usually be drawn; for, as Andral observes, "Dans cette maladie, où les accidens terribles, qui surviennent du côté des voies digestives sembleraient se lier à des lésions intenses du canal intestinal, on ne trouve autre chose dans ce canal qu'une injection plus ou moins vive, qui ne diffère pas de celle qu'on rencontre, sur beaucoup d'autres cadavres, dans des cas où pendant la vie n'a même existé aucune affection grave de l'estomac ou des intestins."—(Précis d'Anat. Path., t. ii., p. 207.)—Ed.

be seen from Dr. Sydenham's description, which is as follows: Vehement vomitings, and difficult and painful dejections of ill-conditioned fluids; agony, and inflammation of the intestines and abdomen, cardialgy, thirst, a quick pulse, often small and unequal, heat and anxiety, nausea and colliquative sweat, spasms of the arms and legs, fainting, coldness of the extremities, and other symptoms, of equal danger, which terrify the by-standers, and kill the patient in twenty-four hours.*

Celsus, who has entered with more minuteness than is common to him into the diagnostics of this species, explains (*Medicin.*, lib. iv., sect. xi.) more fully than Sydenham has done, the exact nature and appearance of the ill-conditioned discharges to which the latter refers. "Bilis supra infraque erumpit, primùm aquæ similis, deinde ut in eâ recens caro lota esse videatur, interdum alba, nonnunquam nigra, vel varia."—"The bile bursts forth both upwards and downwards; at first like water, afterward as though fresh flesh had been washed in it; sometimes white, sometimes black or variegated." And he adds, accordantly with Sydenham, "quibus concurrentibus, non mirum est, si subitò quis moriatur." "All these symptoms associating, it is not to be wondered at that the patient should die suddenly."

As the general commotion of the alimentary canal is to be referred in this species to a superabundance of bile thrown into it, and probably possessing a peculiar acrimony, our first object in attempting a cure should be, not to excite an additional flow by stimulants of any kind, and especially by violent purgatives and emetics, but to dilute and wash it out of the stomach and intestines by a free exhibition of mild demulcent fluids, as well injected by the anus as given by the mouth. And when this has been accomplished, the spasmodic action of whatever parts are affected may be advantageously attacked with opiates. This was Sydenham's practice, and it cannot well be improved upon.

Those diluents and demulcents are to be preferred which agree best with the stomach, and sit easiest and longest upon it. Celsus recommends a free use of water not quite cold, but only just deprived of its chill; "aqua, neque ea ipsa frigida, sed potius egelida, danda est." Lienard, half a century before the time of Sydenham, gave it cold and fresh from the fountain, and, as he assures us, with great success.* And Cleghorn has recommended the same practice even in hot climates in our own times. Dr Douglas was peculiarly attached to toast and water, which he made with oat bread boiled in the water; the bread so thoroughly toasted, that the decoction was as brown as coffee. This has a slight astringency and a little mucilage, and may be a useful diluent. Dr. Douglas declares that he never knew it rejected in any case of cholera. Infusion of spearmint proves, also, a good anti-emetic, but it should be made with leaves fresh from the garden. Sydenham prescribed weak chicken broth for the same purpose, and applied it by injection to the rectum, as well as to the stomach. Linseed-tea or barley-water, with a little gum-acacia dissolved in it, may answer as well. As soon as the alimentary canal has been thus cleared of acrimonious matter, and the sickness subsides, opium, with or without relaxants, should be administered in repeated doses, to subdue the spasmodic action. Sydenham employed it alone, and in his favourite form of liquid laudanum, varying the dose from twelve to twenty drops in mint-water. Dr. Fordyce, with still more judgment, united it with small doses of antimonials, and thus increased its relaxant power.

But if the onset of the disease be very violent, and the pulse and the general health sink rapidly, opium must be given, and very freely, from the commencement.† Cholera is in all cases a very acute disease, and of short duration.‡ I have already observed that it has destroyed in

* Sect. iv., chap. ii. As also Epist. de Morb. Epidem., 1675–1680. At first, the discharge is sometimes thin and watery, and then the complaint has been called *white vomit*, but very soon pure bile comes away.—(Elliotson, op. cit.) The following description of certain serious symptoms, by Dr. Brown, is very correct:—"At the commencement of the attack the skin is generally warm and dry, but, after a few hours, its temperature falls considerably below the standard of health, and is bedewed with a cold and clammy moisture. The tongue is dry, and the thirst excessive; the urine scanty, and high-coloured; the pulse rapid, and generally small and irregular; and the spasms, which affect the muscles of the abdomen and of the inferior extremities, and occasionally those of the hands and arms, recur at short intervals, and are attended with great pain."—ED.

* Dissert. Ergo Choleræ Morbo Frigidus Potus? Paris, 1626.

† Dr. Elliotson joins with the diluent plan large doses of opium, and, in cases of extreme weakness, approves of brandy or other stimuli, and the hot bath. When the disease consists chiefly of vomiting, he thinks it advisable to determine a part of the bile downwards with calomel. If, after a time, a congestion of the head or any inflammation occur, the treatment must be regulated accordingly.—(Med. Gaz. for 1832–3, p. 600.) Dr. Brown is also an advocate for not deferring the administration of opium, which, in severe cases, he joins with calomel.—(Cyclop. of Pract. Med.) In slight examples he gives a grain of opium, or a proportionate dose of laudanum, every second hour, till relief be obtained. In those which are more severe, he prescribes two or three grains of calomel, with a grain of opium at the same interval, till three or four doses have been taken: or, the calomel being administered in a pill, a draught containing a proportion of laudanum, or black drop, equivalent to a grain of opium, may be taken along with it. If gastro-enteritis should come on, leeches and blisters on the abdomen, and three or four grains of the hydrarg. cum creta every fourth hour, till some affection of the mouth is perceived, are the remedies preferred.—ED.

‡ This affection may last only a few hours, seizing the patient, for instance, early in the morning, and proving fatal in the middle of the day. Or it may last many days; and if it subside, it may probably be followed by inflammation. Dr. Elliotson has frequently seen gastro-enteritis take place after the discharge had entirely ceased.—See Med Gaz. for 1832–3, p. 600.—ED.

twenty-four hours. The symptoms generally abate on the second or third day, and the patient recovers rapidly. If there be any considerable degree of weakness on the decline of the disease, it may be necessary to have recourse to the warm and bitter tonics, of which columbo will be found one of the best.

[The following mixture is strongly recommended by Mr. Hope (*Edinb. Med. and Surgical Journ.*, No. 88, p. 39), of Chatham, for its efficacy in cholera:—℞ Acid. Nitrosi ʒi., Mist. Camph. ℥viij. Misce et adde Tinct. Opii. xl. One fourth part to be taken every three or four hours.]*

SPECIES II.
CHOLERA FLATULENTA.
WIND CHOLERA.

THE VOMITING AND PURGING RARE, OR ABSENT; GREAT AND OPPRESSIVE FLATULENCE; RETCHING; FLATULENT DEJECTIONS AND ERUCTATIONS.

This species I have continued from Hippocrates, who denominates it, from the absence of liquid discharges, cholera, ξηρὴ, as Sydenham, by translating the Greek term, has done, *cholera sicca*.—(Sect. iv., cap. ii.)

In this species the bile, instead of being excessive in its flow, is obstructed or diminished in its quantity, and perhaps secreted with too low instead of too high a degree of pungency. The liver is evidently torpid and enfeebled; and as flatulence is always a sign of debility, we have a full proof that the stomach and intestinal canal are in the same state. We have here, therefore, cholera grafted upon a dyspeptic habit; and as, in dyspepsy, some quantity of air is let loose from most foods, whether solid or liquid, and an immense portion from many kinds, we are at no loss to account for the flatulence. The absence of evacuations is partly from spasmodic constriction, and partly from a want of wholesome bile; and the retching does not pass into vomiting, because the diaphragm, on whose expulsive co-operation the action of vomiting chiefly depends, forms a link in the entastic chain, as is obvious from the increased anxiety of the præcordia.

When cholera, therefore, is an epidemic malady, it will show itself under this form in persons of a highly dyspeptic idiosyncrasy, still more generally than when it appears as a sporadic disease. But the form is not a common one; and hence in the epidemic cholera of 1669, Sydenham declares that he met with not more than a single instance of it: "Unicum," says he, "duntaxat exemplum me vidisse memini ineunte hujus anni autumno." And on this account Dr. Cullen has rejected the species altogether; as others have transferred it to the genus Colica. But as the disease does exist, though it does not occur often, and as the distinguished symptoms of anxiety and spasms of the extremities, which peculiarly draw the line between cholera and colic, are equally present in this and the other species, we cannot disjoin them without confusion. They are produced by the same occasional causes, as surfeit, cold drinks upon a heated body, cold vegetables, as melons, inedible fungi mistaken for esculent mushrooms, poisonous animal and mineral substances; they all take place sporadically, and all are at times epidemic.

The cure should be commenced with warm cathartics alone, or intermixed with opium, as the compound tincture of rhubarb, or of aloes. Usquebaugh, or the tincture of capsicum, has often also been found useful; and when the paroxysm is removed, the restorative plan should be pursued, which has been already recommended for dyspepsy.

SPECIES III.
CHOLERA SPASMODICA.
SPASMODIC CHOLERA.

BURNING PAIN IN THE EPIGASTRIC REGION; THE DEJECTIONS WATERY; INEFFECTUAL RETCHINGS, OR VOMITINGS OF A WHITISH FLUID;

* A form of this complaint, which is sometimes produced by the irritation of teething, is very prevalent among children during the summer and fall months in the United States, and is also extremely fatal. We allude to the *cholera infantum*. By Dr. Hosack (*Med. Essays*, vol. ii.), this affection is considered as a febrile disease, analogous to the bilious remittent of adults; and Dr. Butter seems very properly to have termed it the infantile remittent fever,—in which opinion the late Dr. Mann, of Massachusetts, also coincides. Accordingly, instead of prescribing anodyne and astringent mixtures to lessen the discharges from the bowels, Dr. Hosack recommends medicines to allay the febrile irritation, and directs that the stomach and bowels be emptied by small doses of ipecacuanha and rhubarb: calomel and antimonials are frequently prescribed with good effect in this disease. The former medicine, in small doses, according to Dr. James Jackson (*N. E. Journal*, vol. i., p. 336), is one of the most useful—perhaps the most useful medicine employed in this disease, as it answers four intentions. 1st, It excites the stomach and bowels to evacuate their contents. 2d, It excites a change in the actions of the secretory vessels of those organs, and by sympathy produces similar effects in the liver and pancreas. 3d, In consequence probably of the last mentioned action, it appears to produce on the stomach the effect of a tonic. 4th, It occasions a more equal circulation over the whole body. The last effect is aided by frictions and warm bathing. Dr. Hosack remarks farther, "When the febrile symptoms are removed, weak brandy and water, or port wine and water, beef-tea, the liquor of oysters or clams, are useful in restoring the tone of the primæ viæ. But if the irritations of the intestinal canal continue after the febrile symptoms are removed, the chalk julap, with a little laudanum or paregoric, may judiciously be prescribed. In some instances, where the diarrhœa is attended with tenesmus, severe gripings, and the discharges are tinged with blood, small injections of starch and laudanum, or an infusion of rosemary (*statice limonium*, Linn.), are among the most effectual aids to lessen these evils. But of all the modes of preventing or curing this disease, none is so effectual as removal to the seashore, where the atmosphere is not only cooler, but in a particular manner restores the appetite and strength of the patient."—D.

SPASMS SUCCESSIVE AND VIOLENT, OFTEN EXTENDING TO EVERY ORGAN; BLOOD DRAWN FROM THE ARM BLACK AND VISCID; GREAT DESPONDENCY AND PROSTRATION OF STRENGTH.

THERE is no species of disease that has of late years attracted more, perhaps none so much, attention, both at home and in the east, as the fatal cholera we are now about to consider.

We dare not say that it is an epidemy of modern origin, since it seems to be described by Bontius, and is supposed by some writers to be glanced at by several Greek physicians,* and even by Celsus. [Independently of the early notices left us by Bontius, and the more recent ones by Dellon,† in 1689, by Curtis and Paisley in 1774, and by Sonnerat from 1774 to 1781, Mr. Scott‡ endeavours to prove that it was described by the medical writers of the Hindoos, and particularly in a work ascribed to Dhanwantari, a mythological personage, corresponding to the Greek Esculapius. He also informs us that an epidemic prevailed at Arcot and other places about 1781, the occurrence of which was entered in the proceedings of the Madras Medical Board on the 29th of November, 1787, in the following terms: —"A disease having in October last prevailed in Arcot, similar to an endemic that raged among the natives about Paliconda in the Ambore Valley in 1769–1770, in an army of observation in January, 1783, and in the Bengal detachment at Ganjam in 1781, &c., as well as to an epidemic over the whole coast in 1783, under the appearance of dysentery, cholera morbus, or *mordyxim*, but attended with spasms at the præcordia, and sudden prostration of strength, as characteristic marks," &c. Mr. Scott adverts also to the occurrence of cholera in the Mauritius in 1778, and again in 1819; at Madras in 1782; at Vellore in 1787; at Arcot in the same year; in the northern Circars in 1790; and in the vicinity of Trincomalee about 1804. Some fatal cases are also reported to have occurred at Jaulnah in 1814.] The subject, however, is yet unsettled; and Mr. Annesley will not allow that the disease alluded to by Bontius, and still more lately by Sonnerat, is the exact disease before us.§ But we may at least affirm, that it has of late years assumed an activity, fatality, and extent of range that it does not seem, from any history that has descended to us, to have possessed in earlier times; and that cannot be contemplated without horror: on which account it has been compared by Mr. Orton to the sweating sickness, and various other pestilences, that, with great fury and mortality, have ravaged the world in former periods.*

Some of the cases that occurred to Sydenham in the first species of cholera, and which we have already noticed, were so rapidly fatal that this distinguished pathologist has also been conceived to have been acquainted with the present species, and to have included it under them. But his description does not seem to warrant any such conclusion; [for, he says, it prevails at the end of summer and during the autumn, as regularly as vegetation comes in spring; whereas this disease occurs at all seasons, and has no connexion whatever with heat. Sydenham describes it as a discharge of bile, and not of the peculiar fluid which we see in this affection.—(See *Elliotson in Med. Gaz.* for 1832–3, p. 628.)] Dr. Cullen, in like manner, upon a cursory view, might appear to have had his eye directed to it; for he has loosely copied Sydenham's remark, that cholera is sometimes so severe in its symptoms as to destroy life in twenty-four hours. But, on a more attentive survey, it will be perfectly clear that Dr. Cullen does not even, under this character, refer to the species before us; for he considers an increased secretion and discharge of common or yellow bile as a symptom belonging to every species of the genus; and contends that those cases which have not this mark are samples of diarrhœa, or some other disorder, but do not appertain to cholera.

Sauvages seems to have regarded cholera in all its species as a less momentous disease than even Cullen; for though he professes to follow Sydenham altogether in the mode of treatment, he takes no notice whatever of Sydenham's remark, that its symptoms are sometimes so violent as to destroy life in twenty-four hours. He has given, indeed, from Dellon, a species which he calls *cholera Indica*, but which differs very materially from the present, in being distinguished by delirium, a *strong* though unequal pulse, and a free flow of urine, both red and white, yet always limpid; as though the complaint were accompanied with inflammatory fever.

[It was from India and the adjoining countries, that the first clear and faithful descriptions of this species of cholera reached us; and even before the disorder had extended to Europe, the British practitioners in Asia had favoured us with so extensive a mass of communications that we were already in possession of a tolerably correct history of the general nature of the disease, how ignorant soever we might then be, and still are, of its remote cause; and Professor Cru-

* Scoutetten thinks that it was described by Wang-Chou-ko, a Chinese, who lived before Hippocrates, under the term Ho louân. The Hindoo physicians assert that the cholera has always existed in Hindostan.—(See Med. and Top. History of Cholera Morbus, translated by Doane. Boston, 1832.)

† Voyage aux Indes Orientales. Amsterd., 1689. It was intimated to Dr. Good by the Army Medical Board, that in a few official documents at the East India House, which were re-examined, the present disease is distinctly referred to, as having existed in the Bengal territory about a century ago, which will bring it only a little below the time when Dellon published his statement, and consequently give it confirmation.

‡ Report on the Epidemic Cholera, &c., by W. Scott, fol., Madras, 1824.

§ Sketches of the most prominent Diseases in India, &c., 8vo. Lond., 1825.

* Essay on the Epidemic Cholera of India, passim, 2 vols., 8vo. Madras, 1820.

veilhier (*Anat. Pathol.*, 14me. livr., Paris, 1830) pays a very handsome and well-merited compliment to our countrymen in India, when he states that the observations subsequently collected at Moscow, Warsaw, Vienna, Berlin, London, and Paris, have only confirmed, or exhibited under new forms, the facts recorded in the modest accounts drawn up by our medical brethren at Calcutta. Not the slightest doubt, then, can be entertained of the absolute identity of the Indian and European cholera: hence their dependance upon some common, grave, and powerful cause, which overcomes all the circumstances of race, climate, temperature, season, and social customs; hence also the suspicion that the disorder was imported into Europe by the Russian army in its invasion of Poland.]

Among those who seem distinctly to have noticed it, though in a cursory way, are Sonnerat and Bartolomeo; the first of whom tells us, that it is called by the natives *mordezym*, a term which, according to Bartolomeo, Sonnerat has transformed, rather than translated, into *mort de chien;* but which I am more disposed to think is a corruption of the Arabic MORDEKIE, or MORDECHIE, the very name by which Dellon says the natives denominated it, and which significantly imports "the death-blow:" according to Golius, *actio inferens mortem;* and hence synonymous with "mors repentina," or "mors violenta."

By the name of *mort de chien*, however, in what way soever derived, it is, according to Mr. Curtis (*An Account of the Diseases of India in* 1782–3, &c. Edin., 1807), most generally known in the present day, and particularly at Madras; and under this name, therefore, he has described it. To this gentleman we are indebted for one of the earliest histories of the disease that within the last fourteen or fifteen years has reached our own country; and which, added to Dr. Girdlestone's statement (*Essay on Hepatitis and the Spasmodic Affections of India*, Lond., 1787), began first of all to draw the attention of British practitioners to its truly formidable character.

Mr. Curtis, whose history was published in 1807, regarded it, at that time, as a new disease; and finding no name for it in the nosological classifications, proposed, from its leading symptoms, to call it SPASMODIC CHOLERA; and it is thus denominated in the present work. From the absence of yellow bile, and perhaps of bile of any kind, by which the disorder is peculiarly distinguished, some of the writers in India have objected to the term cholera, as conceiving that such a term necessarily imports a redundance of this fluid, and that too, of its natural colour, and other qualities; yet, as I have already had occasion to show, there is no such necessity whatever imposed on the term, but merely an understanding that the bile is morbidly affected in its secretion, either in quantity or quality of any kind, and consequently there is no reason for changing the term on this ground.* Nor are there always spasms in any part of the body; for the disease, at least as it has of late shown itself, in some cases destroys instantaneously, and before it has assumed its regular character: but I do not remember to have met with a single instance of its having run on for twelve hours without having developed this essential symptom.

Mr. Curtis informs us, that soon after the attack, "the spasms began to affect the muscles of the thighs, abdomen, and thorax, and lastly passed to those of the arms, hands, and fingers; but I never," says he, "then or afterward saw those of the neck, face, or back at all affected. The rapidity with which these spasms succeeded the attack, and their severity, especially as affecting the muscles of the thorax and abdomen, denoted in general the degree of danger in the case. The affection is a fixed cramp in the belly of the muscle, which is gathered into a hard knot with excruciating pain. In a minute or two this relaxes; is again renewed, or the affection passes to others; leaving the miserable sufferer hardly an interval of ease; and lastly,

* At the present day, many practitioners object to the name for a reason which our author has not considered. Certainly if only one stage of the disease were regarded, in which vomiting, purging, spasms, and prostration take place, the pathognomonic symptoms of cholera, the term *spasmodic cholera* would seem allowable; but, as Dr. Brown argues, "when it is remembered that the choleric symptoms, if not fatal, prove but the commencement of a series of changes, to which any one, who witnessed them alone, would give the appellation of *fever*, and which men of great experience in the disease have declared they could not distinguish from typhus; if we observe, too, that long before this epidemic excited attention, symptoms strikingly resembling those of cholera had been observed to form the initiatory stage of certain malignant fevers (see Dr. Negri's letter to Dr. Barry; Morton, Pyretologia, pp. 16, 13, 81; Torti, de Febribus, lib. iii., p. 124; and Med. Essays, by J. Brown, M. D., pp. 37–39), we are disposed to admit that it is really a fever, and that to designate it merely cholera is to take a part for the whole," &c.—(Dr. Brown in Cycl. of Pract. Med.) The name which this gentleman prefers is that suggested by Dr. Johnson, namely, *epidemic choleric fever*. On the other hand, it might be argued, that a consecutive fever is not invariable; and one remark made by Drs. Russell and Barry is, that such fever is of more frequent occurrence in Russia than India. In the cases which the editor has had opportunities of seeing, in the King's Bench and elsewhere, if the patients recovered from the stage of collapse, febrile symptoms always followed, though in very different degrees in different examples. This observation accords with the following statement:—"We can positively assert, that we have not met with a single case in England in which fever did not intervene between the choleric or cold stage and restoration to health; and the result of inquiries we have addressed to individuals the most observing, and most familiar with the disease in this country, has proved that their experience has coincided with our own. It is true that in some cases this fever has been slight, but the choleric stage has been so likewise; for we have always observed a correspondence in intensity between these stages."—(Dr. Brown in Cyclop. of Pract. Med.)—ED.

it passes from one set to another, leaving the former free."

This account is supported by Dr. Johnson in his valuable "Essay on the Influence of Tropical Climates:" yet, as a proof that the Eastern cholera has of late assumed a severer and more fatal character, it is only necessary to observe, that the subsequent cramps, regarded by Mr. Curtis, and no doubt justly so, as indicative of the highest degree of danger, have, since the period to which his writings refer, been hailed as less ominous than many of the symptoms with which the disease now occasionally opens; and contemplated as a reaction of the system struggling against the first shock; proving that it has not been totally and instantaneously exhausted of sensorial power, as a Leyden vial is exhausted of its electricity by the discharge of the brass rod when applied to it.

The later and more fatal ravage I am now referring to, commenced its attack in August, 1817, at Jessore, about a hundred miles to the northeast of Calcutta; and spreading from village to village, reached Calcutta early in September, having destroyed thousands of inhabitants in its course. From Calcutta it extended to Behar, depopulating many large cities, and compelling the residents to flee for safety to other spots. Benares, Allahabad, Goruckpore, Lucknow, Cawnpore, Delhi, Agra, Muttra, Meerat, and Barcilly, all suffered in succession; the pestilence not diffusing itself at once, but travelling by a chain of posts, and attacking a second district after it had ravaged a first.

At length it reached the grand army, and spread through its different divisions at Mundellah, Jubbulpore, and Saugor, marching in terrible array over the Deccan. At Hussingabad its havoc was dreadful for several days; when, taking a course along the banks of the Nerbuddah, it alighted at Tannah. Having visited the famous cities of Arungabad and Ahmednugger, it spread to Poonah, and, in the direction of the coast, to Panwell, where it ramified north and south, crossed Salsette, and arrived at Bombay in the second week of September, 1818, a twelvemonth after its appearance at Calcutta.

While this was passing in the west of the Peninsula, the epidemy was making a like progress to the east and south, progressively extending over the whole Coromandel coast: whence it was reported to have spread, and a report that afterward proved to be but too true, to Ceylon; to the pure air and temperate climate of Siam; to Malacca; and, across the Straits of Sunda, to China; since which time, it has reached the Mauritius, and made its appearance on board vessels both in harbour and at sea. [In the summer of 1821, the disease first commenced its ravages on the borders of the Persian Gulf, after having raged in the earlier months of that year at Bombay. In 1823, it had extended itself, in one direction, to the shores of the Caspian Sea, and, in another, as far as the Mediterranean, making an apparent stand at Astrachan, and in the neighbourhood of ancient Antioch.* At this period, therefore, it very closely threatened Europe. It had passed over 90° of longitude and 66° of latitude; having, in one direction, crossed the equator, and approached the boundary of the southern tropics; and, in another, traversed the northern tropic into the temperate zone.]

The diagnostics of this extraordinary pestilence are admirably furnished for the period before us, by Mr. Whyte, assistant surgeon to one of the divisions of the army, whose description I shall copy; premising that, while in the centre division the spasms preceded the vomiting and purging, in the others they generally came on after the appearance of these symptoms.

The disease, says Mr. Whyte, commonly begins with a watery purging, unattended with griping or any pain. At an interval of generally from half an hour to five or six hours, and sometimes without any interval, the patient vomits a white fluid uncombined with bile. The spasms, in the division of the army from which this description is drawn, made their attack at no determinate period of the disease; but, in general, not for many hours after the commencement of the vomiting and purging. There was soon great debility and sinking of the pulse; the extremities became cold; the eyes sunk in their sockets; the vessels of the tunica adnata were injected with red blood, over which, if the disease advanced, a film was formed; the features expressed the deepest anguish; and the eyelids were either wholly or half closed. The patient invariably complained of great heat at the stomach, and called incessantly for cold drink. The tenesmus now became violent, while nothing was discharged but the fluid just noticed, and a substance like the coagulated white of an egg. The uneasiness and jactitation were so great, that it was with the utmost difficulty an opportunity could be got of feeling the pulse, which by this time was not always perceptible, although it was generally so till the spasms came on. These were always of the rigid kind, attacking first the toes and legs, and then extending to the thighs, chest, and arms. When they reached the chest, the breathing became so difficult, and the sense of suffocation so extreme, that the diaphragm most probably associated in the spasmodic action. [In one case, mentioned by Mr. Scott, where a man had been paralytic in his limbs, with a total numbness of them, they were severely affected with spasms, and became exquisitely sensible.]

The most unfavourable and dangerous signs in the ordinary progress of the disease were, a coldness of the surface, extending over the region of the heart and stomach. The skin,

* Dr. Rehman, in Hufeland's Journ. for June, 1824, or in Edinb. Med. and Surg Journ., Nos. 82 and 83. In 1828, it re-appeared at Orenburg, and in 1830, advanced through the southern provinces of Russia to Moscow. From Russia it extended itself into Poland, Germany, Great Britain and Ireland, Holland, France, Portugal, and the New World. Its general course has been, therefore, towards the northwest, with occasional deviations from it.—Ed.

under the nails, became incurvated; the tongue was icy cold; a universal colliquative sweat broke forth, with a shrivelling of the palms of the hands and soles of the feet: the spasms gradually declining as these symptoms increased. In general, all pain and spasm left the patient before death; and even when the heart could not be felt to beat, he expressed himself easy, and said he was better. Sometimes, however, he was, at this period, in the greatest agony, rolling himself on the ground, groaning, and even bellowing most piteously; signs chiefly occurring in patients who lingered three or four days before death came to their relief.

In this description the onset or invasion of the disease is hardly noticed with sufficient minuteness; and I readily supply the deficiency, in this edition, from my friend Mr. Annesley's admirable delineation:—"The patient feels for several hours, or for a greater or shorter period, according to circumstances, a sense of general uneasiness and anxiety about the epigastrium, with a feeling of heat in the same situation. These symptoms increase more or less rapidly; and the countenance, which at first is merely expressive of uneasiness, soon becomes more and more anxious and distressed. The pulse at this time is generally quickened, and always oppressed. This state of the system forms the first stage of the disease; a stage which, from its importance in the treatment, I have called the stage of invasion."* Mr. Annesley's two most prominent symptoms are the sense of heat, or burning pain, as he afterward calls it, in the epigastric region, which is generally felt before the vomiting and purging take place; and the black, thick, and ropy condition of the blood, particularly when the disease is fully formed. He expressly tells us, he never saw a case unaccompanied by the former of these symptoms, while the latter appears to have been as universal;† and I have hence been induced to add both these signs for the first time to its specific character.

[The mind remains clear almost to the last. A favourable issue is denoted by a rising of the pulse, a return of heat to the surface, an inclination to natural sleep, and a diminution or cessation of vomiting, purging, and spasms; these indications being soon followed by the reappearance of fœcal matter in the stools, of bile, of urine, and of saliva. Mr. Scott dwells on the rapid sinking of the pulse as one of the most invariable symptoms; the exceptions being only a few, and chiefly where remedies are promptly administered. In an early stage the pulse generally becomes small and accelerated, and, on the accession of spasm or vomiting, suddenly ceases to be distinguishable in the extremities. The length of time during which a patient will sometimes live in a pulseless state, is extraordinary. Dr. Kellett relates a case where the pulse was gone within three hours from the attack; yet, the man lived in that state from the 3d of October, at four P. M., to the 6th, at two P. M. On the cessation of the spasm or vomiting, and sometimes apparently from the exhibition of remedies, the pulse will return to the extremities for a short time, and again cease. The superficial veins and arteries are not always collapsed, even when the pulse has ceased; and, if opened, they will bleed. Their parietes then collapse, and no more blood can be extracted. In every fatal case, the circulation stops, at least in the extremities, long before death.*]

The following appearances were remarked on dissection: an enormous distention of the stomach and bowels, not from air, but a gelatinous substance; little sanguineous turgescence on the surface of the organs, but an absence of the moisture and glossy character of health: the liver much enlarged from the quantity of blood contained in its vessels, and, on one part of its convex surface, a considerable extravasation of blood: the gall-bladder filled with bile, and projecting beyond the edge of the liver; the bile of a very dark colour, and the gall-ducts pervious. The contents of the small intestines were dark-coloured, apparently from an admixture of bile: the contents of the large intestines resembled the white albuminous matter that was discharged before death.† The urinary bladder was

* Sketches of the most Prevalent Diseases of India, &c. By James Annesley, 8vo. Lond. 1825. The whole of this paragraph, in Dr. Good's handwriting, was lately found among his papers, with a reference to the part of this work in which he intended to have inserted it.—Ed.

† The appearances of the blood in the epidemic cholera of Europe correspond to Mr. Annesley's description of them in relation to the disease in Asia. The blood is observed to be black or dark-coloured, not unlike tar, and in its consistence thick, ropy, and semi-coagulated. It may be doubted, however, whether Dr. Good was correct in altering the definition, so as to embrace these changes in the blood; for, according to the Madras Report, in a few cases they did not occur, though the blood was always deficient in serum, and destitute of the buffy coat. Chymical analysis of the evacuations from the stomach and bowels proves, indeed, that what the blood has been deprived of is to be found in them, inasmuch as the fluid and more copious part of them consists of pure serum, and the coagulated part, or flaky matter, of fibrin. —Ed.

* Scott's Report on the Epidemic Cholera, &c., p. 21–25. Madras, 1824. Professor Cruveilhier knows of some instances, in which the brachial artery was opened, but only a few drops of blood could be procured from it.—Anat. Pathol., livr. 14me. In several cases, the editor has felt the carotids beating forcibly, when no pulsation could be perceived in the arteries of the limbs.

† In a certain number of cases at Paris which proved fatal at the blue period, Cruveilhier found the small intestines distended with an enormous quantity of choleric fluid. When, however, the patient had got through the blue stage, and died sometime after the reaction, none of this liquid was seen in the small intestines, but a yellowish or greenish pultaceous substance, which is compared to the meconium. The follicles were constantly enlarged: every shade of colour, from pink to a reddish black, was seen in different instances in the mucous coat. Frequently, points of ecchymosis were noticed; and when the intestine was of a brownish red colour, and a piece of it was held between the light and the eye, the most delicate arborescent vascularity was seen. Vascular con-

quite empty and wholly shrunk into the pelvis; the kidneys apparently diminished; the lungs so much collapsed as hardly to fill one half of the cavity of the chest: no fluid in the pericardium.

Such were the appearances in the body of a sepoy. In the European subject they were the same, with the two following exceptions: the stomach and intestines were distended with wind, instead of with gelatinous fluid, and hence collapsed upon puncturing them: the veins on the outer surface of both, as well as of the meso-colon, were turgid with blood.

[An excellent description of the appearances on dissection in the cases at Madras was published by Mr. Scott, and it shows that they vary considerably in different examples. No particular alteration is found, he says, in the serous membranes; but the mucous ones generally exhibit signs of disease. The lungs are not unfrequently found in a natural state, but more commonly they are gorged with black blood, and assume the appearance of liver or spleen. Sometimes, however, they are collapsed, lying in the hollows at the sides of the spine, and leaving the thorax nearly empty. The heart and large vessels are distended, and sometimes even its left cavities are filled with dark blood. In the abdomen, the vessels of the viscera are turgid.* According to Mr. Scott, the stomach generally preserves its ordinary volume, sometimes containing greenish or yellow turbid matter. The intestinal tube is sometimes collapsed, but more frequently filled with air, distended into pouches containing whitish, turbid, dark, or green fluid. No fœcal or other solid matters are found in the intestines; but, very commonly, large quantities of the conjee-looking fluid, or of turbid serous matter. The duodenum, and occasionally the jejunum, are loaded with an adherent whitish or greenish mucus; at other times deprived of their natural mucus, and often quite healthy. Traces of bile in the intestines, or of any substance that has descended from the stomach, are exceedingly rare. Sanguineous congestion, and even active inflammation, Mr. Scott represents as more frequent in the bowels than in the stomach, yet as being often absent. He confirms the account given by other writers of the large quantity of bile in the gall-bladder; but he adds, that the gall-ducts are about as often constricted and impermeable as in the opposite state. The appearances of the spleen, he says, are so diversified, that they throw no light on the nature of the disease. The vessels of the mesentery are generally very full of blood. In the head, appearances of congestion, and even of extravasation, have been frequently observed, but not uniformly. In one case, the sheath of the spinal marrow was inflamed.*

The essential morbid appearances produced by spasmodic cholera, form yet a subject of inquiry; for those which sometimes occur and sometimes do not, cannot be regarded in this light.† Perhaps the accumulation of the greater

gestion was almost always most strongly marked near the valve of the cœcum, and diminished in proportion to its greater distance from this point. Frequently, such congestion was restricted to the two or three last feet of the small intestines, though sometimes it was manifest through their entire length. In general, the intensity of the redness was in an inverse ratio to its extent. But, from all the facts which came under Cruveilhier's observation, he concludes, that the morbid appearances are the most constant and important in the great intestines. These bowels are sometimes distended with fluid; sometimes contracted at intervals, as if encircled with a cord at particular points. The choleric fluid was usually found in the great intestines, characterized by its limpid quality, and flakes of mucus, or its resemblance to rice-water. The genuine fluid of cholera, according to Cruveilhier, is only met with in the body of those who have been rapidly destroyed by the disease, and is not copious, unless the alvine discharges have been suppressed. When the patient has struggled two or three days against the disorder, the choleric fluid is not pure, being frequently of various colours, or, like the mucous secretion, tinged with blood. The follicles of the large intestines, near the valve of the cœcum, are in general much developed, and perforated at their centre, which is indicated by a black point. Frequently they are surrounded by a red areola.—(Cruveilhier, Anat. Pathol., livr. 14me., p. 37.)—ED.

* The disease, as it presents itself in Europe, agrees with this account. In the *post mortem* examinations at Paris, Cruveilhier noticed that the right cavities of the heart and the left ventricles were distended with a great quantity of blood. The left ventricle was sometimes moderately dilated, but, in other instances, so contracted as not to contain a drop of blood. The large arteries were full of liquid blood, but the small ones contained none at all. The whole of the venous system, and more particularly the veins of the abdominal viscera, were gorged with blood.—(Anat. Pathol., livr. 14me., p. 38.)

* In the patients who were victims to the disease at Paris, the spleen was generally small, dense, but more brittle than usual, and with an appearance as if the blood had been pressed out of it. The brain and cerebellum were healthy, but injected with blood as in asphyxia; sometimes with slight ecchymosis; there was little serosity in the ventricles, or under the arachnoid membrane. The medulla spinalis was healthy, its different sections being tinged with red points. The semilunar ganglions, the solar plexuses, the ganglions of the great sympathetic nerve, the intervertebral ganglions, the pneumo-gastric nerves, and the whole of the nervous system, appeared to Cruveilhier, in the numerous cases where he examined it, to be perfectly sound; and he expresses his surprise that Delpech should have met with traces of inflammation in the semilunar ganglions.—(Anat. Pathol., livr. 14me., p. 38, 39.)

† On this interesting point, the statement of Cruveilhier confirms the truth of the remark in the text. After giving a description of the appearances revealed by dissection, Cruveilhier thus proceeds:—"From what has been explained in relation to the morbid anatomy of cholera, it is manifest that this disease is not one of those of whose nature a complete interpretation can be found in any anatomical lesions; since, besides the cases in which such lesions are clearly marked, others are met with in which they are slight, doubtful, and even totally absent. If, then, we apply the fundamental axiom in morbid anatomy to cholera, namely, that *every organic change that does not constantly attend a disease, cannot be considered as making an essential part of it*, the importance of *post mor-*

part of the blood in the vessels of the viscera, the absence of all solid or fæcal matter from the intestines, the suppression of the flow of bile into them, the full state of the gall-bladder, the empty and contracted state of the urinary bladder, and the presence of a gelatinous or turbid serous fluid in the bowels, are the changes most inseparably connected with the worst and fatal forms of the disease.]

The disease proved everywhere more fatal to natives than to Europeans: and, among many of the former, no blood could be drawn from the arm, however urgent the symptoms.

The Bombay accounts differ in only a few particulars: the spasms were sometimes clonic or agitatory, instead of being entastic or rigid. "In a large proportion," says Mr. Orton, "there is no appearance of spasm in any part of the system. In many there is no purging; in some, no vomiting; and, in others, neither of these symptoms.* I have already observed that these last were by far the most dangerous cases, and that the patients died under them, often in an hour or two; the nervous power appearing to be exhausted almost instantaneously, like the electric fluid from a Leyden jar. Mr. M'Cabe, depôt-surgeon at Poonamallee," says the same author, "informs me that he has found the cases which to common observation might appear the most desperate (those which were attended with spasms and retchings of extreme violence) actually among the most tractable: a truly valuable remark, which my own experience fully confirms. Dr. Burrell saved eighty-eight out of ninety of his later cases" (*Bombay Report*, p. 68—80), meaning those of this kind. And in his general description of them he says, "that the retching was constant, and the spasms so violent as to require six men to hold the patient on his cot." On the other hand, nothing can be more evident than the intractable and fatal nature of those cases, in which the pulse, instead of rising, sinks at once; in which there are no spasms, and scarcely any vomiting or purging; and in which not only the excretion of bile, but of all the secretions, appears to be entirely suspended.—(*Essay on the Epidemic Cholera*, p. 29.) [It is also particularly remarked by Mr. Scott, that, in the low and most dangerous form of cholera, whether in European or native cases, spasm is generally wanting, or is present in a very slight degree.*]

In a few instances, there was even an overflow of yellow bile itself, making an approach to our first species: but these were uniformly of the slightest kind. "The bile," says Mr. Orton, "appears in excess only in the milder cases."—(*Orton's Essay*, p. 71.) And to the same effect Mr. Curtis: "The cases which appeared after this were all of a different nature, much less severe, and none turned out fatal. They were all of them combined with bilious accumulations."—(*Diseases of India*, p. 66.)

The rapid or sudden fatality of the disease in its severest onsets is very singular. Even Sonnerat affirms, "that the patient was frequently carried off in twenty-four hours." But in the later epidemy of 1817 and 1818, this term was wonderfully abridged. "In the second, and very fatal visitation," says Mr. Orton, "of the epidemic experienced by Brigadier-general Pritzler's force, I am informed that vomiting, purging, and spasms were very frequently, in a great measure, if not entirely, absent; all the powers of the system failing at once, and death commonly ensuing in three or four hours from the attack."—(*Essay on the Epidemic Cholera*, p. 41.) Several instances were heard of at Hoobly and other places, of natives being struck with the disease while walking in the open air: and who, having fallen down, retched a little, complained of vertigo, deafness, and blindness, and expired in a few minutes. Mr. Gordon gives a history of many cases of this kind. At Bellary, a tailor was

tem examinations in the study of cholera will seem but limited, and the true characters of it must be looked for elsewhere."—Anat. Pathol., livr. 14me., p. 40.) Dr. Brown, after detailing what was remarked in the dissections at Sunderland, expresses his conviction, that the symptoms during life throw much more light on the nature of the disease, and its appropriate treatment, than appearances after death.—(Cyclop. of Pract. Med.) In Europe, the bodies of those destroyed by cholera putrefy slowly, as is always the case with subjects which have been deprived of considerable quantities of blood. On the other hand, the alimentary canal putrefies rapidly, as happens in all cases of considerable sanguineous congestion of the digestive organs.—(Cruveilhier, op. cit., p. 35.)

* In Europe the disease exhibits similar varieties: thus, with respect to the cases which occurred at Paris, Cruveilhier informs us, that the most constant symptoms were thirst, pain in the epigastrium, vast alteration of the features, with the eyes shut and retracted, small pulse, enfeebled voice, suppression of urine, and disposition to coldness. On the contrary, in some cases, *evacuations from the bowels, vomiting, and cramps*, did not take place. The absence of evacuations from the bowels, however, was a rare circumstance, and also an unfavourable one, as denoting not a stoppage of the flux, but merely an interruption of the excretion of the matters secreted.—(Anat. Pathol., livr. 14me., p. 11.)—Ed.

* Report on the Epidemic Cholera, &c. Madras, 1824. At Paris, the spasms were among the least constant symptoms of cholera, and Cruveilhier assures us that the gravity of the disorder could not be estimated by them. They began in the muscles of the feet, and proceeded more or less rapidly to those of the legs, thighs, arms, abdomen, thorax, and masseters; they were exceedingly painful, occurred at more or less considerable intervals, and persisted, in some instances, to the last moment; while, in others, they ceased with the collapse.—(Anat. Pathol., livr. 14me., p. 12.) In the cholera at New-York, spasms occurred in about three fourths of the cases. They were sometimes late in their appearance. Their violence seemed to be proportioned to the severity of the purging and vomiting; they were greatest in robust, especially intemperate persons, and more marked in males than females. In children they were rare, or slight.—See Paine's Letters on the Cholera Asphyxia, 8vo., New-York, 1832; one of the most unprejudiced and candid works which the editor has read on this subject; and he feels much obliged to Dr. Paine for his kindness in sending him a copy of his valuable observations.

attacked with what was supposed to be cholera, and instantly expired, with his work in his hands, and in the very attitude in which he was sitting.—(*Bombay Reports*, p. 82.)

The dissections in this presidency seem to have shown even a more extensive range of visceral effusion, congestion, and extravasation than those in Bengal. Not a single thoracic or abdominal organ was to be traced unmarked by vascular rupture, or turgescence of black blood, or unstamped with some other morbid appearance: the stomach and liver, however, were chiefly affected, and the urinary bladder was always shrivelled.* The blood, when drawn from the arm, was found to coagulate very loosely, and sometimes not at all (*Orton's Essay*, p. 69): and the arterial and venous blood were of a like purple hue.†

Of the dreadful spread and havoc of this cruel scourge we may form some idea, from the report to the Medical Board at Bombay, by George Ogilvy, Esq., secretary. The population in this district alone is calculated at from 200,000 to 220,000; the total number of ascertained cases amounted to 15,945: giving a proportion of seven and a half per cent. Of these, 1294 had been without medicine or medical aid, and there is reason to believe that every individual of this number perished. Mr. Ogilvy, indeed, expressly asserts that it was not ascertained that any case had recovered in which medicine had not been administered: while it is gratifying to learn, on the other hand, that, among those who had received the advantages of the judicious and active plan concurrently pursued, the proportion of deaths was reduced to 6.6 per cent.; an alarming mortality still, but a marvellous improvement upon the natural course of the disease. In other parts of India, indeed, the deaths, under the same plan of treatment, seem to have been still fewer: for Dr. Burrell, surgeon to the sixty-fifth regiment, at Seroor, out of sixty cases, makes a return of only four deaths; and Mr. Craw, on the same station, asserts, that on an early application for relief, the disease in his opinion "is not fatal in more than one in a hundred cases."‡

The curative plan pursued with so much success consisted in bleeding, according to the strength of the patient; calomel in free doses of from fifteen to twenty grains in a dose; with one or two grains of opium, repeated, if necessary, every four, three, and in some cases every two hours, till the urgency of the symptoms abated: to these were added a liberal use of the most diffusible stimuli, as the spirit of nitric ether, ammonia, camphire, hot arrack and water, mixed with spices and sugar, camphire-mixture, essential oil of peppermint, the hot bath, stimulant embrocations; and sometimes the antimonial powder in doses of five grains, given in conjunction with the calomel.

We are informed of a fortunate blunder in one instance, capable of being laid hold of and applied with great practical advantages. "By mistake, twenty grains of calomel and sixty minims of laudanum were given at an interval of less than half an hour. The patient was inclined to sleep; nothing more was done; and, in two hours and a half, he was as well as ever he had been in his life."

Many of the cases proved successful without the use of the lancet: but, according to Dr. Burrell's return, the hazard of omitting it, whenever blood could be made to flow, seems rather unjustifiable; for, out of a hundred patients eighty-eight were bled, and twelve not; of the former, two died, being one to forty-four; of the latter, eight, being two thirds, or nearly thirty to forty-four. The fact appears to be that scarcely any case occurs without an alarming congestion in one or more of the larger organs; and hence it is highly hazardous to depend upon stimulants alone, and to boast of their power to subdue the disease without active evacuants in the beginning of the curative process, as Hufeland, and other writers on the continent, appear to have done (*N. Annalen.*, i., 404; *Gazette Sanitaire de Bouillon*, 1787); and as Dr. Rankeen of the Benga station has recommended still more recently, who treats calomel with as much contempt as the lancet, and depends exclusively, from the first, upon large doses of opium, and highly pungent and diffusible stimulants.*

* Reports of Dr. Burrell and Mr. Whyte. In the *post mortem* examinations at Paris, the kidneys appeared to Cruveilhier to be in the natural state; but the bladder was as contracted as possible, and completely empty, at least in those subjects which had perished in the stage of asphyxia; for urine is commonly found in the bladder of other individuals, who die in the period of reaction. In the dissections made in France, the liver was gorged with blood, but unequally, which gave the part a morbid appearance.—Ed.

† For the ravage and treatment of this disease in the Madras presidency, see, in addition to Mr. Scott's Report, Sketches of the most prevalent Diseases of India, comprising a Treatise on the Epidemic Cholera, &c. By James Annesley, Esq. Lond. 8vo., 1825.

‡ Further experience has not proved such efficacy in this, or any other mode of treatment hitherto suggested; nor does any method appear to be attended with uniformity in its degree of success in various places. As Dr. Joseph Brown observes, "in taking these estimates into consideration, we must always recollect, that, in epidemics, there is often a very wide difference in the gravity of the disease at different points, or in different years; indeed, sometimes at nearly the same point, and in the same year; so that, when we hear of an extremely small loss, in proportion to the number attacked, long experience does not permit us to doubt that, in such a case, the type of the disease has been very mild."—(Cyclop. of Pract. Med., art. Cholera.)—Ed.

* Edinb. Med. and Surg. Journ., Jan., 1823, and compare with Dr. Robson's History, id., Oct., 1823, p. 507. Had Dr. Good lived to have seen this extraordinary disease, perhaps he would not have been such an advocate for the early use of the lancet. At all events, its advantages are disputed by men of great experience. Dr. Mouat's observations are decidedly against bleeding. Venesection, which was tried in forty-six cases, was of no benefit, and, in several, it was decidedly injurious. The treatment found to answer best consisted of large doses of calomel with opium, magnesia,

Of the remote cause of this extraordinary malady we know nothing. That it is an epidemy, and of a most malignant character, is unquestionable; but whether dependant upon an intemperament of the atmosphere, or upon specific contagion, is by no means ascertained. The first was the most obvious mode of accounting for it, and that which was earliest adopted; but by many practitioners it has been rejected, for the following reasons:—The disease, instead of spreading from a centre to a circumference, or following the course of the wind, or of the sun, or obeying any other meteorological power, marched by a chain of posts, often in direct opposition to all kinds of atmospherical influence, and in the immediate track of human intercourse. "It prevailed," observes Sir Gilbert Blane, in his remarks upon Mr. Corbyn's letter, "to a degree equally violent at all seasons of the year: in regard to temperature, from 40 or 50 degrees of Fahrenheit to 90 or 100: in regard to moisture, during the continuance of almost incessant rain for months, to that dry state of the atmosphere which scarcely leaves a vestige of vegetation on the surface of the earth."—(*Med. Chir. Transact.*) To which I may add, that it often fought its way in the very teeth of the most powerful monsoons, and left untouched various districts that bordered on its career, and whose less salubrious features seemed to invite an acquaintance with it. It appeared also and vanished in all the changes of the moon, and in all states of atmospheric electricity: and at sea as well as at land. Mr. Corbyn, indeed, gives an account of its having made an attack upon the Lascars of an Indiaman, in its passage from England to the Cape of Good Hope, in 1814; and that too in the month of January, when the weather was intensely cold.—(*Treatise on the Epidemic.*) [This alleged attack of cholera, however, requires proof of its having been similar to the spasmodic cases in India, where it had not then arisen in its worst and most fatal shapes. It is even asserted by Mr. Scott, that no instance has ever been recorded of the crew of a ship suffering from cholera, that is to say, the real spasmodic cholera, until the vessel had come into communication with the land.—(*Report on the Epidemic Cholera*, &c., p. 39.) Spasmodic cholera, we know, broke out in the Mauritius, 3000 miles from a place where it was prevailing; but it was after a vessel had arrived from that very place.]

Many pathologists, who suppose the disease to be propagated by a specific contagion, have endeavoured to show that it appeared in no town or district where a direct communication had not been maintained with some place in which it was prevalent. [They insist on the considerable mortality among the attendants on the sick; a point, however, on which much contrary evidence is adduced, and which perhaps may be generally quite as well explained by the exposure of such individuals to the same atmospheric causes, or other circumstances by which the patients themselves were affected. Yet, some facts in support of contagion are strong: the medical officer, Mr. Scott says, in repeated instances, has been the only European in the corps or station who has suffered. Dr. Daun and Mr. Gray, assistant-surgeon of H. M. 89th regiment, were both seized with the disease, after close intercourse with the sick; and two friends, who attended the latter, were also attacked, while no other European officer of the corps suffered. Another fact, stated by Dr. Kennedy, is, that in the course of the twelvemonth ending June, 1826, four medical officers of the Bombay establishment out of 116 died of cholera, while among the other gentlemen, civil and military, so great a proportion of casualties from cholera did not occur in the whole course of the epidemic from 1817 downwards.* But, in order to show the contradictory evidence brought forward, it is only necessary to mention, that while one reporter states, that every one of the thirty medical attendants of the 65th regiment was attacked, another declares, that only one out of 101 medical attendants of the Royals had the disease.† No doubt, therefore, some important collateral circumstances, adequate to explain this difference, must have existed, though they were not traced and specified. By some reasoners, little importance is attached to the numerous instances recorded, in which the disease, after appearing in a district, has extended itself over it, apparently by communication with the sick. Facts of this kind, as a critical writer observes, are easily explained by the non-contagionists, provided it cannot be shown that *the disease spread gradually*, and *from the original spot of its appearance as a centre, except where a deviation from its regular course was connected with special intercommunication or special seclusion.* One of the most striking features of a contagious disease is its progressive advancement from district to district, and from country to country, and more especially the *slowness* with which it advances. He joins Sir Gilbert Blane in the belief, that such a character can only be derived from the mode of propagation being by human intercourse. When viewed in relation to this character, the history of the cholera of

stimulants, blisters to the epigastrium, bottles of hot water to the sides and feet, and friction with the hand. (See Trans. of the Med. and Phys. Soc. of Calcutta, vol. iv., art. 22.) Respecting the practice of bleeding, then, we see much diversity of opinion exists. In the King's Bench, where the editor has had opportunities of seeing the disease, venesection *in the early stage of the complaint* has generally been abandoned, though sometimes practised in the febrile stage with decided success.—Ed.

* See Kennedy's Notes on the Epidemic Cholera, 8vo., Calcutta, 1827. This work, and the writings of Sir Gilbert Blane, contain the best exposition of the arguments in support of the doctrine of contagion.

† At St. Petersburgh, 25 medical attendants out of 264 were attacked, and nine of them died; yet Drs. Russell and Barry, who communicate these facts, inform us, that in one Military General Hospital, where 400 cases of cholera had been admitted, only one medical practitioner was seized with the disorder.

the east furnishes a very powerful argument in support of its contagious nature. Its slow progress across and down the peninsula, in 1818, can hardly be explained on any principle, except that of propagation by human intercourse. This intercourse, Dr. Kennedy observes, was established by means of the troops; and it seems, that *since* 1817, *it has been enforced from one end of India to the other by the annual relief of troops.*—(*Notes on the Epidemic Cholera*, p. 53.) In short, it is argued, that some effectual intercourse must be necessary for the propagation of the disease, on account of the remarkable shortness of its course, and the brief interval which (if it be really propagated by infection or contagion) elapses betwixt exposure and seizure. The two characters will not interfere with the rapidity of diffusion of a contagious disease over a town, or thickly-peopled district; but must render nearly harmless all ordinary communication between one district and another even moderately remote. The cholera spreads rapidly in a particular spot, but slowly from one part of the country to another. But by far the most unequivocal evidence of the propagation of a disease by intercourse with the sick, is that which is enforced by Dr. Alison; namely, the evidence of the disease breaking out in several previously unaffected districts, at a time corresponding with the arrival in them and sickening of persons who had intercourse with the sick in an infected district. It is to this criterion chiefly that we must look for the decision of the question of the contagiousness both of cholera and other diseases, whose propagation by intercourse is at present a subject of dispute.* It has been asserted by the believers in the propagation of cholera by contagion alone, that the disease has always been found to move in the line of human intercourse; but, though this seems to be the case, its diffusion has not been in proportion to the intercourse between infected and healthy districts. Thus, as Dr. J. Brown has noticed, its appearance at Madras, whither, according to the exclusive doctrine of contagion, it ought to have been conveyed almost three months earlier, by trading vessels from the infected districts, was simultaneous, as Mr. Bell informs us, with its origin in parallel latitudes in the interior. It did not reach Ceylon, to which, on the contagious principle, it ought to have been conveyed at a much earlier period, by shipping from infected parts of the coast, until it had previously gained the nearest point to it on the continent, about Adam's Bridge, and had been long prevailing on both coasts of the peninsula.

* See Edinb. Med. Journal, No. 93, p. 426—431. As an illustration, the breaking out of the disease at Jaulnah may be referred to, after the arrival of a party of troops there from Nagpore, in which place the disease was then raging. From Jaulnah it next extended itself to Malligaum and Hydrabad.—(Madras Report.) In several fortresses in the territory of Orenburg, also, the invasion of the epidemic coincided in point of time with the arrival in them and sickening of persons coming from infected places.—(Lichstenstadt on the Asiatic Cholera as it appeared in Russia in 1829–30. Vide Edinb. Med. and Surg. Journ., No. 108.)

—(*Orton on Cholera*, 2d ed., p. 332.) Unfrequented villages have been observed to suffer the invasion of the disease, as early as the marts of intercourse and commerce. Thus, from a statement of Mr. Orton, it seems to have reached some villages on the north bank of the Cavery, detached from any frequented road, and considerably to the eastward of Trinchinopoly, quite as soon as this large and frequented town, whither it *appeared* to have been imported by a company of sepoys.

"Its movement along *navigable* rivers has been dwelt upon, as evidence that human intercourse has been the means of its diffusion; but when we are informed, by Mr. Orton, that the disease manifested this predilection for the course of rivers in the peninsula of Hindostan, where navigation is scarcely carried on, even to the most trifling extent, on any river, and scarcely an instance can be mentioned of any great road running on the banks of a river, for they almost always cross them, we must acknowledge that more weight has been attached to the argument than it is calculated to bear.

"The disease, in its general course, has manifested a preference for one line of movement, and has rejected another, though there has been no striking difference in the amount of human intercourse between the two directions to explain the preference and rejection. Its progress in a northwestern direction, across the European continent, has been briefly described," &c.

For three years it prevailed in the Ottoman territories bordering on the Levant, without losing any of its destructive character; for in November, 1832, it carried off in Aleppo 4000 victims in eighteen days; yet, as Dr. Brown has observed, it did not penetrate into Turkey in Europe, and other extensive realms on the shores of the Mediterranean. "Assuredly," says he, "this could not arise from want of means of transport, and few will be disposed to ascribe it to the perfection of the quarantine department of the Sublime Porte." Since its appearance in Great Britain, "a similar predilection has been displayed: for we find it at this instant 140 miles to the N. W. of Sunderland, while six miles south is the extreme distance to which it has reached in that direction; and from the point which it attained, Seaham Harbour, after attacking eight persons, and destroying three, it has since vanished."—(*Cyclop. of Pract. Med.*) Dr. Brown is led to the conclusion that the disease possesses a contagious property, though in so feeble a degree as to render it more than questionable whether it can be the sole agent in diffusing the disease. That endemial influences prevail, was convincingly illustrated in Sunderland, where the disorder committed infinitely the greatest ravages in dirty parts of the town, situated low, and near the banks of the river. In the village of Newburn, the whole of which is thus conditioned, 120 persons, of whom 55 perished, had been attacked out of a population of 550, and the disease had not yet ceased.]

Certainly it is not easy to reconcile the suddenness of its appearance and disappearance with the laws of contagion, so far as we are ac-

quainted with them; a subject we shall have occasion to examine at large, when treating of fevers. Mr. Allardyce informs us, that in the 34th regiment the disease appeared on the 21st of September, and committed dreadful ravages before night. On the 25th it abated remarkably, and in three days more entirely vanished.—(*Reports communicated to the Bombay Medical Board.*) In like manner, the severe attack which was experienced by the Bengal and Madras troops at Nagpore, occurred at the end of May, 1818. On the 10th of June the rains appeared with great violence, when the epidemy abated, and immediately afterward ceased. * Neither is the idea of a contagious propagation reconcileable with the escape of the great body of persons exposed to the influence of the disease, considering that, from its not being apprehended to be contagious, no means, as is usual in other cases, were employed to avoid the infection.

The state of the atmosphere, as described by Mr. Allardyce, did not differ materially from that in Nagpore. The disease made its attack in close and sultry weather, and vanished after thunder-storms and heavy rains. But we can draw no conclusions from these phenomena; since it seems to have shown itself quite as frequently and fatally after a long succession of rain; and as already observed, sometimes in very cold and dry weather. The remote cause, therefore, of this mysterious scourge, remains yet to be ascertained; and affords further proof, if indeed proof were wanting, of our general unacquaintance with the nature and economy of epidemics.†

With the exception of the plague, there is no epidemy on record that seems to have been so strikingly marked by violence and irregularity of action, and especially by a rapid exhaustion of living power; the patient, as we have seen, often expiring within twelve hours from the attack, and sometimes sooner.

The first characteristic feature that occurs to us, on a review of the disease, is the total absence of the bile from the whole range of the alimentary canal in every case, while this fluid was as generally found in abundance in the gall-bladder: and perhaps the next is, the turgid, and in some instances, the ruptured state of the liver, from the quantity of blood with which it was distended. The general battery of symptoms appears, therefore, to have been opened by a spasmodic constriction of the bile-ducts; for without such an obstruction, we cannot account for an exclusion of all bile from the intestines. From this point, as from a centre, the spasmodic

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* "The gradual diffusion of a disease through a limited community, those near the sick being first attacked, and others in succession, in proportion to their proximity, Dr. Joseph Brown admits, is strong evidence of a disease being contagious. But this evidence, he observes, has rarely been furnished by the cholera; the general statement from India, indeed, is of a totally opposite nature; for we learn that on its appearance in any place, numbers are simultaneously attacked, and that after committing unheard-of ravages for a short period, its cessation is as sudden as its invasion. One example, however, of this gradual diffusion is given in the Russian Reports, and this is furnished by Dr. Schimanski, with regard to the extension of the disease at Iletsk. He says he was able to trace the progress of the disease in the first eight cases thus: the husband of the woman (a soldier's wife), from Orenburg, was taken ill three days after her; and about the same time also, two girls, who lived in the immediate neighbourhood of the soldier, and who visited him soon after his arrival from Orenburg; the aunt of these girls, who nursed him, was next attacked, and from her it passed to her own two sons."—See Dr. Brown's article in the Cyclop. of Pract. Medicine, and the Edinb. Med. and Surg. Jour., No. 108.—Ed

† Various facts, mentioned by Dr. Haslewood, support the doctrine of spasmodic cholera being a contagious disease.—(See Med. Gazette, vol. x.) Dr. Elliotson has a strong suspicion that the disease is contagious; but believes that it may also spread independently of contagion (Lect., &c.), and this is the view which is entertained by many others, among whom is Dr. J. Brown. Individuals in good health, and at the same time in good circumstances, are much less liable to be attacked than individuals labouring under the noxious effects of poverty, intemperance, or debility from previous illness, for which two last conditions, it is scarcely necessary to say, affluence will be no counterbalancing protection. A very large proportion of the individuals carried off by this disease in London are known to have been habitual spirit-drinkers. Undoubtedly, exceptions to this statement frequently occur, reminding us of our ignorance of the particular influences which sometimes render thousands susceptible of the disease, though greater numbers, equally exposed to the contagion, if it be such, seem to defy its power. To every mind it would not be satisfactory to attempt to solve the difficulty by reference to the fact, that persons in health are not easily attacked, because when spasmodic cholera suddenly carries off hundreds and thousands in a particular district, town, or division of an army, it is not to be imagined that all these unfortunate subjects had really been in previous bad health. Here endemial influence must be supposed to be in operation. The first case of spasmodic cholera which ever occurred could not possibly have arisen from contagion, but from some atmospheric or terrestrial causes affecting the unfortunate individual the first subject of it. The history of the disease seems to prove that the extension of it is partly, at all events, owing to the same influences. Thus, the disorder may have had many distinct origins in different individuals and parts of the world. In support of this argument the following is a strong case. When the disease attacked the 6th regiment at Colabah, in July, 1828, it was in the midst of the rainy season, when *not a case had been seen for months either in or near Bombay.* Mr. Campbell, in paying his evening visit to the hospital, found an old soldier, who had been under treatment some time for an hepatic affection, suddenly seized with cholera. Mr. Campbell went to the opposite extremity of the building for the purpose of consulting another surgeon, and actually found him busily employed with another man, who had been almost simultaneously affected. The disease proceeded, and destroyed sixty men and several women.—(Spence in Med. Gazette.) The fact of cholera having broken out at Vienna, when Austria had numerous *cordons sanitaires* on the side of Hungary, is often quoted by those who, like Cruveilhier, deny its contagious nature.—Ed.

action seems to have spread in every direction, and under a clonic or entastic form, to have seized upon almost every organ: preying with greater violence according to the greater degree of debility, and hence, perhaps, of irritability of the system; into which law we are to resolve it, that the natives, supported by a less rich and nutritive diet than the Europeans, suffered more severely, and died more frequently. The stomach and intestines, generally speaking, first participated in the spasm of the bile-canals, and hence the griping pains, the nausea, and violent commotions which spread from the one to the other.

In all cases of nausea, from whatever cause, we see the brain and the surface of the body peculiarly diminished in their energy, whence the skin, to the remotest extremities, collapses beneath a deadly chill, and the heart sinks with insupportable langnor. In the ordinary course of sickness the nausea subsides, and the general organization recovers its balance, or it terminates in full vomiting, which excites a universal reaction. And where any such reaction occurred in the disease before us, it was hailed as a favourable change; and hence the wisdom of the stimulant plan, so frequently had recourse to by the medical staff, for the purpose of producing a revulsion. But where this was not accomplished, the living power, feebly recruited from its fountain from the first, or not recruited at all, became exhausted in every organ apace, the strength failed, and hope gave way to despair.*

In the Island of Ceylon, where the disease raged with even more violence than on the Indian continent, the patient very frequently expired in twelve or fifteen hours from its attack. The dissection of those who perished thus early in this quarter, has put us into possession of some interesting facts, varying in a few particulars from those that occurred on post-obit examinations in the Island of Bombay. The brain was in these cases chiefly the congested organ, the liver sometimes appearing to have no congestion whatever; and hence the inactivity produced in the brain by the nauseating state of the stomach, must have been greatly augmented by oppression. Consentaneous herewith we are told by Dr. Davy, that in some of the cases which he dissected in this region, there was a flaccidity of all the muscular parts,* as in animals killed by electricity or hunted to death. There was also a tenderness of the muscular fibres; while antecedently to death, as in many of the Bombay cases, there was no difference in the colour of the arterial and venous blood, and no instance of a buffy coat on the blood that was drawn; which in reality was so loose and uncoagulable, that when venesection was necessary, the vessels were opened with the greatest caution, from the difficulty of restraining the blood afterward.

In certain cases, the muscles of the extrem-

* Searle, Stevens, Desruelle, and others, believe that the poison of cholera (supposing such to exist) is introduced into the circulation, and combined with the blood, through the medium of which it produces its effects on the solids of the body, and not by any direct impression on the nervous system. Other pathologists represent cholera as making its first impression on the nervous system, either without limitation, or with the restriction of such impression to the central ganglionic system. These views are rejected by others; thus, Dr. Paine concludes that the brain and nerves are not the primary seat of cholera, and that they subsequently participate less than some other organs in the morbid action; he allows, however, that they may serve to transmit the impression from the morbific agent to other parts of the system; and this is, perhaps, as much as the advocates of the hypothesis mean to assert. "If we look at the mind," says this intelligent physician, "we shall find it 'sitting unimpaired and serene amid the ruins of organic life.' Respiration is only performed by the voluntary muscles; pulsation has long ceased in the extremities; the heart has become inaudible to the stethoscope; yet the integrity of the mind remains undisturbed; and the indifference with which it contemplates the wreck over which it presides, proves, that at least its peculiar and last abode in the body is still its own uninvaded possession. The powers of the mind are fully exercised in respect to the voluntary muscles; and it is not unusual to witness successful attempts at walking, when the pulsations of the heart are only sensible to the ear." While the functions of the brain are wholly undisturbed, "the heart and the lungs, and all the viscera of organic life, are involved in a chaos of disordered action. Animal sensibility is not known to be particularly affected till near the termination of life. It is scarcely augmented or diminished, or in any way modified,—a remarkable circumstance, if we regard the common influence of disease on that property, and which serves to demonstrate the little participation of the nervous system in the great conflict of nature. The sufferer is even conscious of the unequal distribution of heat, and feels, as intensely as if in health, the action of stimulants upon the cold, and shrivelled, and livid surface of his body. He hears and sees with a natural acuteness." Such facts, Dr. Paine conceives, render the hypothesis of diminished nervous energy quite paradoxical. His particular notion is, that "the proximate cause of cholera asphyxia consists in a *simultaneous modification of all the organic powers and functions*, produced by some unknown morbific poison, acting either directly on the properties (of the body?), or transmitted indirectly through the nervous system." If, says he, we assume a local proximate cause, we should always be able to detect its existence; but "we have now been presented in New-York with many cases in which the invasion of the most malignant constitutional symptoms was abrupt, and in which there could not be detected a solitary evidence of antecedent local disease."—See Paine's Letters on Cholera Asphyxia, p. 71–77, 8vo. New-York, 1832. The rest of Dr. Paine's argument on this part of the subject is instructive, even without admitting his own particular hypothesis; for he has ably exposed a variety of erroneous views, and this, at all events, is clearing the way to truth.—ED.

* In Europe this is not generally the case; thus, at Paris, the muscles were found by Cruveilhier to be in such a state of rigidity, that he compares their appearance to what is seen in the bodies of persons executed.—(Anat. Pathol., livr. 14me., p. 35.) At New-York, the muscles were also observed to be very rigid in the dead body.—(Paine's Letters on Cholera Asphyxia, p. 147.) They are likewise of a very florid colour.—ED.

ities, and even of the face and lower jaw, were observed to move in a convulsive manner and sometimes to be drawn into tremulous knots, fifteen or even twenty minutes after death had closed the scene. So the heart of the traitor, when extirpated after he has been beheaded, from an accumulation of sensorial power, has been seen to palpitate, and even to leap up for several times in succession, after its removal from the pericardium.

Commonly, however, the living principle seems to have been exhausted more generally and progressively; and the muscles, and indeed most of the organs, freed from the tetanic power that at first constringed them, to have been gradually relaxed and flaccid: and hence that comparative absence of pain that occurred so frequently a short time before death, with a flow of a cold sweat over the surface of the body, and of bile into the smaller intestines.*

The grand objects, in the treatment recommended by the medical boards in India, were to equalize the distribution of the blood and nervous influence, to counteract the spastic action so common to the irritable diathesis of hot countries, to guard against the danger of congestion in the vital organs, and to restore the natural secretions of the system. The great danger of congestion was guarded against by bleeding; spasm and irritability were opposed by powerful narcotics; and the full and repeated doses of calomel were admirably calculated to act upon the secernents, and restore them to their proper functions, and especially when united, as was occasionally the case, and, perhaps, always ought to have been, with antimonials. All this was sometimes accomplished rapidly, and the disease ceased in a few hours. But if, from the violence of the attack, or from any other cause, it could not be accomplished at all, such violence could not long be resisted; and the patient in a few hours, or at the utmost in two or three days, fell a prey to its fury.

Sir James M'Grigor has informed me, that the disease in the Mauritius did not appear till after the arrival of a ship on its coast from Ceylon, where the epidemy was raging; some of the crew of which were seized with it on their passage, though all were well at the time of sailing. As a single fact, this is not sufficient to prove contagion; but, in the present uncertainty of the subject, the statement is worth treasuring in mind.

[Another fact, bearing on the same question, and tending to support the doctrine of contagion, is, that the disease does not appear to have reached the shores of the Persian Gulf by land; but broke out in the seaports and trading towns, immediately after the arrival of ships from Bombay. It soon afterward raged in Schiraz, and its extension to Ispahan was greatly apprehended; but the latter city was preserved from it, as is alleged, by the governor-general prohibiting the caravans of Schiraz from passing through the place.—(*Dr. Rehman, in Hufeland's Journal for June*, 1824.)]

Mr. Cornish, in a communication dated Tabriz, in Persia, October, 1822, announcing the arrival of this fearful disease on the western boundary of the Persian empire, expresses his belief that it is an epidemy not dependant on contagion, and then adds the following alarming prediction: "The atmosphere is generally clear, cold, and healthy; and if, in such a climate, this epidemic commits such ravages as almost to equal its effects in many parts of India, I much fear it will extend to Europe, where the crowded cities and great population will make it more severely felt than it has been in the scattered cities and scanty population of Persia."—(*Medico-Chir. Trans.*, vol. xii.)

"Dii, prohibite minas! Dii, talem avertite casum!"

[Unhappily, Mr. Cornish's prediction has proved but too true, and the identity of the disease in Hindostan, Europe, and America, admits of no rational dispute. Its nature is everywhere the same, though subject to modifications, more especially in relation to its fatality, which has been much greater in certain places and in the invasions of particular periods than in others.

The Bengal Report adverts to a fever which attended the second stage of the disease. Now this consecutive fever is stated by Dr. Russell and Sir David Barry to have been more frequent in Russia than in India; that is to say, the direct restoration to health from the cold stage, without the intervention of such fever, was more common in India than at St. Petersburgh. Among other points of difference between the cholera of India and that of Europe, they specify the following:—"The evacuations, both upwards and downwards, seem to have been much more profuse and ungovernable in the Indian, than the European cholera, though the quality of the evacuations is in both cases the same. In India the proportion of deaths in the cold stage, compared with those in the hot, was far greater. Then the number of medical practitioners and hospital attendants attacked with cholera, in proportion to the whole number employed, and the other classes of society, is stated to have been, beyond all comparison, greater in Europe than India.—(See *the Report of Drs. Russell and Barry to C. C. Greville, Esq.*)

Dr. Brown's definition of epidemic cholera, as it presents itself in England, is perhaps as correct as any that has been suggested:—"After watery diarrhœa, or other generally slight indisposition, vomiting and purging of a white or colourless fluid, violent cramps, great prostration and collapse, the last occurring simultaneously with the vomiting and cramps, or shortly after them. Should the patient survive

* Some writers impute the effect of spasmodic cholera to the absence of bile; yet abundance of this fluid is in the gall-bladder, and even after the reaction, when bile has found its way into the stomach and bowels, this circumstance frequently does not prevent a fatal termination.—(Cruveilhier, livr. 14me., p. 41.) This eminent pathologist inclines to the doctrine, that the disease essentially consists in an affection of the secreting function of the gastro-intestinal mucous membrane. He is led to this conclusion by the quality and quantity of the fluid voided from the bowels.—*Ed.*

the last train of symptoms, a state of excitement and fever supervenes."—(*Dr. Brown, in Cyclop. of Pract. Medicine.*) By *collapse*, Dr. Brown particularly signifies the feebleness or almost the arrest of the circulation; the death-like appearance, the coldness, shrinking, and occasional blueness of the surface, which may be observed in other diseases, after they have existed some time, but which occur in the cold stage of the epidemic shortly after its commencement. The *degree* and *early accession of this collapse*, and the *white discharge*, seem to Dr. Brown the only distinctive marks between this stage of the epidemic and ordinary cholera.

Cruveilhier arranges all the complaints pertaining to epidemic cholera under three heads:—1. Choleric purging, with slight cholera. 2. The state, or degree, between this and the worst forms of the disease, he terms *cholera moyen*. 3. Lastly, malignant cholera (*cholera très-grave*), with or without asphyxia. By *choleric purging*, he means that in which the evacuations are liquid, colourless, with little or no smell, and an appearance like that of turbid whey, or rice-water. The transition from a choleric purging into cholera, is denoted by vomitings, painful spasms in the limbs, urgent thirst, severe pain about the epigastrium, sudden change of the countenance, a sinking of the eyes into the orbits, feebleness of the voice, tendency to coldness, and depression of the pulse.—(*Anat. Pathol.*, livr. 14me., pp. 1–11.)

A better division is into the *incipient*, the *cold*, and the *febrile stages*. All men of experience agree, that most of the cases seen in this country are preceded by some kind of indisposition, as lassitude, vertigo, sense of nausea, oppression about the stomach, or a sense of indescribable uneasiness in it, which ailments are immediately followed by a degree of diarrhœa. Such are the *premonitory* symptoms, as they are called, in which a looseness of the bowels is generally one of the principal circumstances. This looseness, frequently accompanied by tenesmus and colic, when very profuse, brings on, almost immediately, considerable emaciation, complete prostration of strength, feebleness of the voice, a tendency to coldness, and slight cramps. Writers also coincide on another important fact, which is, that when such diarrhœa is rightly treated in its early stage, the accession of cholera may commonly be prevented.* Varieties occur, however, in the mode of attack; for while in the greater number of instances, a diarrhœa precedes the commencement of this species of cholera, in other patients, the complaint comes on without any kind of warning, frequently in the middle of the night, or a little before daybreak,† although the individuals were perfectly well at the time of going to bed. They awake with severe pain about the stomach, and are soon seized with vomiting and purging, the discharges being at first tinged with bile, but soon becoming colourless and serous, or assuming the appearance of a turbid whitish fluid, like rice-water, with white flakes in it. The evacuations from the bowels are so copious that they are rapidly followed by extreme debility, and, even before any vomiting and cramps take place, they sometimes bring on a collapse, especially in elderly subjects, or individuals whose constitutions are already impaired by intemperance or recent illness.* In some few instances, there is not a single evacuation from the bowels; yet the large intestines are found after death completely distended with the fluid characteristic of the disease. Thus is ushered in the *cold stage*, so called from the remarkable tendency which the body has to become exceedingly cold; it is, indeed, of an icy coldness, or, as Cruveilhier expresses himself, the coldness is like that of death itself. Even the tongue and breath, as it issues from the mouth, are cold. Dr. Elliotson, on passing a thermometer into the mouth, found it to range from 84 to 90 degrees Cramps, attended with a severe degree of suffering, begin with the vomiting, or even precede it; the pulse becomes frequent, and extremely feeble; the respiration hurried, sometimes 36 in a minute,† the features shrink, the eyes sink into the orbits, and the countenance, which is of course wonderfully changed, is either livid, or very pale.

The first cholera patient whom the editor saw was in the cholera hospital near Bethlehem, and though only 22 years of age, his face would have warranted the conjecture of his being at least sixty. This person had not been ill more than twelve hours. The *facies cholerica* is so characteristic, that Cruveilhier represents it as being in general sufficient to establish the diagnosis. The eyes sunk in the orbits; the dirty leaden hue of the countenance, when it is not livid; the tendency to blueness of the lips and cheeks; the hideous retraction of all the features; the emaciation, of truly astonishing rapidity, and only partly accounted for by the profuse evacuations from the stomach and bowels, are common appearances in cholera.—(Op. cit., p. 12.)

After a time the vomiting and spasms either

* The same interesting circumstance was noticed at Paris:—"Je n'ai pas vu un seul devoiement cholérique, convénablement traité dès le moment de l'invasion, qui ait dégénéré en choléra."—Cruveilhier.

† "It has long been remarked in other countries, that the cholera makes its attack in the night, and particularly towards the approach of day. I think it has so happened in New-York, in the majority of cases; and the next period most common is in the morning, and the next in the afternoon."—Paine's Let. on Chol. Asphyxia, p. 84.

* See case by Cruveilhier in Anat. Pathol., livr. 14me., p. 21. This author met with several cases in which the stools consisted of blood and mucus, and the patient was removed by tenesmus: in some of these instances the post-mortem examination detected precisely the same anatomical lesions as in dysentery.—(Op. cit., p. 18.)

† Respiration varies in different examples: it may be natural or hurried; in other instances, slow and sighing, but always incomplete; not reviving the blood, as Cruveilhier expresses himself; a defect which he refers less to any impairment of the mechanical part of respiration, than to some injury of its vital phenomena.—(Anat. Pathol., p. 13.)

totally subside, or recur at lengthened intervals. The pulse, which has been becoming smaller, and more and more accelerated, at length ceases entirely in the extremities, though the beating of the heart, and sometimes of the carotids, may still be perceptible. Severe pain in the epigastric region is one of the most constant symptoms: when the patient is asked what is the matter with him, he places his hand upon his stomach, or the sternum, and complains of vast oppression, dejection, and sometimes of burning pain in that organ. Many of Cruveilhier's patients said to him, "Remove what I suffer there, and I shall get well."—(Op. cit., p. 12.) If the disease be accompanied by blueness, which is not invariably the case, various shades of this colour occur on the hands and feet, and frequently also on a considerable portion of the arms and legs; indeed, the whole body has been known to exhibit a blue appearance. The hands are shrivelled, corrugated, and soddened, and the fingers often drawn together. The patient is tormented with ardent thirst, and has an insatiable desire for cold beverages. The voice is surprisingly altered; it is like that of a person dying of strangulated hernia, and characterized by mingled huskiness and feebleness. Not only is there a stoppage of the flow of bile into the intestinal canal; the urine, in severe cases of cholera, is not secreted during the collapse, and consequently the bladder is empty. When the disease has advanced to its final stage, the patient is like a corpse; the eyes, partly open, shrivel up, either from the absorption of their humours, or from a mechanical transudation of them; the sclerotica, just under the cornea, becomes as dry as parchment, that is to say, immediately above the margin of the lower eyelid, and where it is exposed to the air; the patient is absolutely motionless, and seems to be connected with life merely by a little circulation, and a little respiration, the mechanical part of which still goes on, though without any beneficial effect on the blood. Even the tonicity of the skin seems to be quite destroyed, so that when pinched it remains in a fold, just as it does in the dead body; yet the sensations continue, and the patient usually hears very well; nay, when a sudden paroxysm of epigastric pain attacks him, when cramps come on, or he has an urgent desire to go to stool, he will move with violence, and jump out of bed with a degree of vigour that often astonishes the attendants.*

Sometimes, a little previously to dissolution, the temperature of the skin rises, and after death the body becomes warm, and, what is worthy of remark, has been known to continue so for a space of time never observed after death from any ordinary diseases.† In some examples, long after all vitality had apparently ceased, twitches and quiverings of the muscles occurred; thus Dr. Elliotson, in speaking of a case which fell under his notice, informs us that one finger would be drawn in, and then another; the lower jaw would move up and down, and a quivering of the muscles of the thigh might be observed. The same occurrences, we find, were noticed in India.

Mr. Rumsey, of Beaconsfield, has recorded an instance in which the action of the muscles was very surprising. About half an hour after the patient's death, *i. e.* "the perfect termination of respiration and circulation, a friend observed his left arm to move, and very soon it obeyed the contractile and relaxing powers of its muscles, slowly, but unceasingly, for about twenty minutes; it then ceased, and the right arm soon made an extensive motion, which threw the by-standers into a panic. Contraction and relaxation, or a moving backwards and forwards, continued, perhaps, to the end of an hour and a quarter. At this moment the arms, previously cold, had become evidently warmer."*

The condition which nearly resembles death, may last several hours, or even one, two, or three days, but rarely longer. It commonly terminates fatally, though this is not invariably the case; and at Paris, Cruveilhier saw several cholera patients restored to life by a kind of resurrection, after lying a whole day, and for a greater period, in the most desperate state.—(Op. cit., p. 19.)

A considerable number of patients never rally from the collapse at all, but perish without any reaction taking place in the system. The lungs may be filled with oxygen gas, the stomach may have the most powerful stimulants introduced into it, and the bowels have the most irritating clysters injected into them; yet, without any more effect than if the mucous surface of each of these organs were completely insensible, and destitute of all influence on the economy. Under these circumstances the disease has only two stages, *the incipient* and *that of collapse*; but if the patient get over the latter, he is not yet out of danger,—for the reaction which ensues becomes a *febrile stage*, often leading to a fatal termination.† The transition from the collapse

* Cruveilhier, op. cit., p. 19. In the first patient the editor ever saw with this disease, these circumstances were very forcibly exemplified. He had no pulse; he was blue nearly from head to foot; and, though only twenty-two, he looked like the remains of a person of sixty; yet he tried to get up half an hour before he died.

† On this subject, Cruveilhier makes a curious remark:—"The coldness of the skin," he says, "is less intense in the corpse than the living subject;" a circumstance in a great measure owing to the absence of that clammy perspiration which inundates the skin in the last stage of cholera. Mr. Rumsey, of Beaconsfield, accounts for the fact on a similar principle.—See Med. Gazette for Sept., 1833, p. 836. In several subjects the warmth of the trunk maintained itself at the end of eighteen hours very much like what happens in asphyxia. —(Op. cit., p. 35.)

* Med. Gazette for 1832-33, p. 836. On September 28, 1833, a man died of cholera in the Fleet Prison, without any reaction having taken place. Nearly an hour after the breathing and circulation had ceased, his fingers began to move; then the lower jaw; and on the sternum being pressed upon, the right forearm was suddenly thrown across the breast. The muscular movements lasted twenty minutes.—Ed.

† Speaking of the febrile stage, or the reaction,

to the febrile stage is for the most part very gradual; perhaps, after the skin has been of an icy coldness for twenty-four or forty-eight hours, or some other uncertain period, a trivial rise in its temperature commences, and the pulse begins to be distinguishable at the wrist again, generally beating about 80, and soft. The patient, on being roused, is perfectly sensible, and complains of severe pain in the head, and giddiness, and that the light distresses his eyes. "The tongue, in this early stage, is clean and moist, the bowels are readily acted upon by medicine, and the discharges are feculent, and, though somewhat clayey, contain a proportion of bile; but the urinary secretion is sometimes either not restored, or is considerably deficient for a day or two after the establishment of the fever. In the progress of the fever the tongue becomes black, and sordes accumulate about the teeth; the eyes become more and more injected; the intellect more and more torpid; the urinary secretion now returns, and the urine, which was at first dark-coloured and cloudy, is now limpid and pale; and the alvine discharges are darker than at first. However flushed the countenance may appear, the temperature of the surface is below the healthy standard, and the pulse is seldom above 90. It differs from typhus, not only in the deficiency of calorific power, but in the absence of subsultus and muttering delirium; for though delirium sometimes occurs in the night, the condition of the intellect is generally rather one of torpor than of irregularity." The duration of the febrile stage corresponding to this description, is from a week to ten days, and the end often fatal. Dr. Brown considers the brain as the organ principally affected in it, and regulates the treatment accordingly, without neglecting, however, the state of the intestinal canal. In another form, consequent to a less formidable state of collapse than what precedes the symptoms above enumerated, the surface of the body is of a higher temperature, and the pulse stronger and more frequent. Depletion could be more freely practised, and the disease was more tractable. But, according to Dr. Brown's experience, the mildest and most successfully treated variety of the febrile stage was attended with pain in the epigastric region on pressure, headache, and giddiness; the tongue being either clean, with a disposition to become dry and glazed, or slightly white and furred, the skin warm, the pulse free and forcible, the urine high-coloured, the thirst considerable, little or no confusion of ideas, and the eyes not injected. A febrile stage, answering to this type, was observed to follow cases in which the collapse had been inconsiderable, and the urinary secretion not suspended, and in which the disorder had not always been attended with vomiting.

The degree of danger seems to be considerably influenced by the degree of collapse in the cold stage; and it is well observed by Dr. Brown, whether we are to dread a fatal result in the cold or the excited stage, the intensity and duration of the collapse in the former of these stages are the measure of the danger; for if the patient die in this stage, he dies of collapse; and if he survive it, and pass into the state of fever, the character of this fever is dangerous in proportion to the same collapse.*

At Paris, numerous patients, presumed to be convalescent, afterward died in a comatose state; and yet, on opening their bodies, scarcely any vestiges of cerebral congestion were found—hardly any serosity under the arachnoid membrane, or in the ventricles. Many of these unfortunate terminations Cruveilhier ascribes to the immoderate use of opium in the stage of asphyxia; and he particularly cautions us to recollect, that though the animal economy in this deathlike condition is insensible to the most powerful medicines, no sooner does reaction begin, than the system becomes again obedient to the customary laws of life, and acted upon not only by what is now administered, but by what has been previously given.—(Op. cit., p. 32.)

The state of the blood in spasmodic cholera has attracted general attention. Cruveilhier found its properties much the same, both in the dead subject and after venesection. It was characterized by a deficiency of serum, and a consistence very much like that of thick currant jelly. It coagulates imperfectly, and is often compared to tar.

Writers in general impute the loss of serum to the prodigious and rapid abstraction of fluid from the circulation to supply the secretion from the mucous coat of the intestinal canal. In fact, the liquid part of the discharges from the stomach and bowels has all the properties of serum; while the flakes in it consist of fibrin. It is alleged that the blood taken away from patients in cholera does not assume a scarlet colour; but Cruveilhier thinks it would have been more correct to say, that it does so only slowly, and not at all, when its surface is dry.—(Op. cit., p. 39.) In the United States, Dr. Gale detected an oily matter peculiar to the blood of patients afflicted with cholera, and different from that described by Lecanu, and discovered by Schwligué. The former, he says, is obtained by solution of the solids contained in the blood in alcohol; the latter is found floating on the surface of the blood when taken from the body. The proportions vary with the

as it is commonly called, Cruveilhier pronounces it to be a period replete with danger; because "the equilibrium must be re-established, and the determination to the intestinal canal must cease gradually, and not be converted into acute or chronic inflammation."—(Op. cit., p. 29.)

* Dr. Brown in Cyclop. of Pract. Med., art. Cholera. The *depression of the pulse* seems to Cruveilhier to be a better criterion of the degree of danger of the disease than any of the other symptoms. "It is," says he, "by the pulse that the reaction begins to show itself, just as it is by the pulse that the collapse (concentration) is denoted. When it is suspended, not for a few moments, but for some considerable time, the danger is imminent."—(Op. cit., p. 13.) Here we see an agreement between the two latter writers; but Dr. Brown's prognosis, deduced from the degree of collapse, is more clearly explained, more especially with reference to the patient's fate, in the febrile as well as the cold stage.—Ed.

stage of the disease, increasing as it is more advanced.—(*Paine's Letters*, p. 155.) Free acetic acid, regarded by Herrman as a constituent of healthy blood, was ascertained by him to be deficient in the blood of patients labouring under spasmodic cholera.—(See *Med. Chir. Review*, July, 1831, p. 285.) Dr. O'Shaugnessy analyzed the blood of some cholera patients, and not only ascertained that there was a deficiency of water in it, but of its saline ingredients. In two cases, there was a total absence of carbonate of soda. His experiments led him to believe that the saline particles, deficient in the blood, passed away with the alvine discharge; but Dr. Elliotson examined the matter voided from the bowels in several instances where no alkali had been taken, and found it acid (*Med. Gazette*, 1832–3, p. 630); and he does not consider it proved that there is an excess of alkali in the evacuations, as would happen according to the theory suggested by Dr. O'Shaugnessy.

Spasmodic cholera can only be treated in the same unsatisfactory manner as all other diseases whose causes are unknown; and, as Cruveilhier has justly said, we combat merely its effects; just like an unskilful practitioner, who, having to treat a severe ophthalmia, excited by the lodgment of a foreign body on the conjunctiva, attacks the inflammation with the whole series of antiphlogistic means; whereas the simple removal of the foreign body would have been sufficient for the cure.—(Op. cit., p. 45.)

The treatment of cholera spasmodica may be conveniently considered, in relation to the incipient stage, the cold stage, the febrile stage, or period of reaction, and the later consequences of the disease.

The diarrhœa, and other ailments generally preceding cholera, may generally be treated with complete success, if attended to early enough. But on this subject we need say but little, as the discussion would only oblige us to return to the consideration of diarrhœa. Opium is the principal remedy, and when employed early, seldom fails. If there be reason to believe that the looseness is accompanied by chronic enteritis, leeches should be applied to the abdomen.

In the *cold stage of cholera*, or the period of asphyxia, or concentration, as it is sometimes termed, medical practitioners agree very generally about the right indication, which is to rally the constitution by every possible means. The action of the heart and lungs must be promoted; and the whole system must be roused, as far as it can be done, through the medium of the skin, the mucous membrane of the alimentary canal, and respiratory organs. Friction with a flesh-brush, or with stimulating liniments, or large sinapisms; the application of mustard poultices to the epigastrium, and of warm air, or vessels filled with hot water, to the surface of the body, constitute the plans by which the system is usually acted upon *through the skin*. In the last case which the editor attended, the patient happened to be in a small room in the Fleet Prison, and a good fire having been made, it became like an oven, and had an excellent effect in contributing to restore the circulation. Frictions with snow or ice have been occasionally tried, but without any decidedly good effect; though Cruveilhier states that he has occasionally had successful recourse to the partial application of ice for the relief of particular symptoms: thus he says, that ice, put on the epigastrium, sometimes stops the vomiting, and alleviates the intolerable uneasiness about the stomach.* Frictions made with snow, on parts affected with cramp, he also speaks favourably of. But besides the means here specified as acting through the medium of the skin, many others have been occasionally tried, as compresses steeped in ammonia laid along the course of the spine; the application of nettles; the moxa; the cautery; touching the back along the spine with a hammer heated in boiling water; or scalding the surface of the body with boiling water. At Paris, the application to the spine of a blister, ten inches long, and two broad, is alleged by Cruveilhier to have been sometimes serviceable.

The *therapeutic means operating through the medium of the mucous membrane of the alimentary canal*, consist of brandy, ammonia, ether, mustard, oil of turpentine, capsicum, oil of cajeput, and numberless other articles. Their moderate use in the stage of collapse is undoubtedly necessary; but they ought not to be given without limitation, or too long; for it should never be forgotten that in cholera there is a determination of blood to the mucous membrane of the bowels, and when reaction begins, the tendency to inflammation is very great; however, when the collapse is considerable and protracted, internal stimulants cannot be dispensed with; and in addition to those given by the mouth, others are sometimes injected into the large intestines. Thus a pint or two of warm water, with from four to eight ounces of brandy, and one drachm of laudanum, is sometimes thrown up the rectum, and this even repeatedly, as the editor has seen, not only without ill consequences afterward, but with a degree of comfort to the patient which he has immediately acknowledged.

Opium, which is so useful in choleric looseness, is deemed by some practitioners hurtful in the cold stage, as tending to prevent reaction,

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* Op. cit., p. 46. Dr. Paine has long been in the habit of employing ice for the relief of vomiting. "It also allays the thirst, and thus removes one great cause of restlessness. How far it exerts an impression on the morbid action is a subject of inquiry. An extraordinary degree of heat is evolved about the region of the stomach: in one case, in which I applied the thermometer to the surface, a temperature of about 106 degrees was denoted while the patient was expiring. I have imagined that these cases will be more generally benefited by the external application of ice to the epigastric region, than by mustard cataplasms. Ice, too, I have applied advantageously to the head in obvious congestions of the brain, which are frequently attendant on cholera, or arise as one of its consequences. It is also very advantageously applied, for the relief of spasm, to the muscles affected."—Letters, &c, p. 42.

and to bring on the comatose state, in which the patient often dies. In most of the cases attended by the editor and Mr. Hooper, in the King's Bench, opium has been more or less exhibited in the cold stage; but the latter gentleman, whose experience in spasmodic cholera is great, employs this medicine less freely now than formerly. It does no harm, perhaps, in the cold stage; but if reaction take place, it then increases the determination of blood to the head and alimentary canal in a very hurtful degree. The cramps, which appear to call for its exhibition, may be assuaged by it; yet it is to be remembered, that they generally soon cease of themselves.

Emetics, occasionally prescribed in the cold state, for the purpose of rousing the system, is a practice commended by Dr. Brown of Sunderland, and some other practitioners. Cruveilhier conceives that emetics are less objectionable in cholera than they would be if it were a gastritis; and he tells us, that the cases which were treated with ipecacuanha at Paris, were neither remarkable for their successful nor their unsuccessful results. On the whole, emetics may be set down as means of no very great efficacy in this disease.*

Purgatives, especially calomel, as our author has explained, were largely exhibited in India, and the voice of the profession in England is becoming more and more favourable to its administration. Thus Dr. Brown, in speaking of the treatment of the cold stage, observes, that whatever stimulants be employed, calomel, in doses of five or six grains, repeated at intervals of three or four hours, should be given at the same time; it is to be observed, however, that calomel is administered, not with the view of purging, but of affecting the mouth as quickly as possible, and restoring the proper secretions of the digestive organs.

Among the means acting through the medium of the mucous membrane of the alimentary canal, is the solution of carbonate of soda, and of the hydrochlorates of soda and potash.† This medicine has been tried in the King's Bench prison, under the editor's superintendence, but without any very well-marked success. The common sodaic powders, and the effervescing saline draught, are often relished by the patient, but have little or no power over the disease.

The patients are usually greedy of cold beverages, and even of such as are ice-cold. Cruveilhier, after making a comparative trial of these and hot drinks, declares in favour of the latter, the reaction having taken place more quickly and frequently under their use.

Of the extract of belladonna, and nitrate of bismuth, in combination, as a means of relieving the vomiting when particularly obstinate, the editor is not in possession of any very precise information.

Great diversity of opinion prevails respecting the propriety of bleeding in the beginning of cholera. In India, the practice was as much praised by some as it was reprobated by others.* When cholera became epidemic, in the district of the King's Bench, bleeding was very frequently practised on the first accession of the disorder; but, by degrees, this measure became less and less resorted to, and now seems to be nearly renounced in the cold stage of the complaint. However, some practitioners in other parts still regard venesection as advisable at first, while the temperature is not below, or but little below the natural standard, the pulse tolerably strong, with the spasms violent, and recurring at short intervals, *provided no collapse has preceded this favourable condition.*† But should this condition, with respect to circulation and temperature, have followed collapse, then Dr. Brown is averse from venesection. In the one case, he conceives that bloodletting breaks the morbid concatenation, and prevents collapse and congestion, and that, in the other, it lowers the vital energies, which are freeing themselves from a state of oppression. But again, in a more advanced stage, when the constitution is no longer balancing between collapse and fever, and the latter may be considered as established, bleeding is a suitable remedy, if the state of the circulation and the general condition of the patient render it necessary.‡ In the decidedly cold stage, however, this physician disapproves of venesection, and, on the whole, his observations on this part of the subject are as judicious as any which have been published. Mr. Annesley assures us, that in India, bleeding, so far from producing syncope, always improved the pulse; and it is represented by many of the practitioners in Asia, as the grand means of preventing the collapse; perhaps they express in different terms the same thing as Dr. Brown has done in a clearer manner.

Mr. Annesley saved nearly all the patients whom he bled; yet here it must be recollected

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* "Where they have been employed in asphyxiated cholera, I think I am warranted in saying, they have hastened the fatal termination. Where they have been employed with success, I have no doubt it has been in what is regarded as the forming stage of the disease."—See Paine's Letters, p. 44.

† Half a drachm of the carbonate of soda, twenty-four grains of hydrochlorate of soda, and six of that of potash are contained in a dose, which is repeated every half hour. ED.

* Bleeding is supposed, on the whole, to have been more successful in the early stage of the disease in Asia than it has proved in Europe and America. "I entertain no doubt," says Dr. Paine, "that the greater success of this remedy, in the hands of the Anglo-Asiatics, is to be ascribed to the absence of premonitory diarrhœa in the east, and the retention of the fluids in the system," &c. —Op. cit., p. 38.

† In America, bleeding is approved of in the early stage, under the same circumstances as those specified by Dr. Brown. If diarrhœa suddenly invade, and be soon followed by vomiting, without any obvious cause, if the evacuations be serous, the tongue clean, the pulse not much depressed, Dr. Paine pronounces this to be a case for venesection, and perhaps for its repetition.—(Letters, &c., p. 24.)

‡ Dr. Joseph Brown, in Cyclop. of Pract. Med. art. CHOLERA.

that this could not have been in the collapse, because then very little blood could have been obtained; the circulation in his examples must have been going on briskly, and therefore they were favourably circumstanced for the practice. As for bleeding in the period of concentration, it is fortunately impracticable; Cruveilhier, who has generally made the attempt in his practice, owns that he could rarely get out of the vein more than a few spoonfuls of blood: he informs us that he never tried arteriotomy himself, but that he knows of some instances in which the brachial was cut through, and only a few drops of blood flowed out of it. After bleeding, he always applies leeches to the epigastrium, and over the sternum and ribs, followed by cupping-glasses.—(Op. cit., p. 50.)

The plans operating through the medium of the mucous membrane of the respiratory organs, comprise the inhalation of oxygen gas, chlorine, and nitrous oxyde. Mr. Barnes, of Byefleet, who was in the part of India where the disease first broke out, assures the editor that no plan is equal to this for efficacy; and Dr. Brown informs us, that in some cases in which it was tried in Sunderland, an instantaneous amelioration was manifest, the pulse becoming more vigorous, the lips florid, and the patient freed from præcordial oppression. But, says he, the effect has been generally observed to be only transitory. His own opinion is, that inspired for a few seconds in single bladders, no great benefit is likely to accrue from it; but he would speak less positively of the effect of an atmosphere of diluted oxygen, breathed for a considerable period.*

The oxygen and nitrous gases were tried in some hospitals in America, but without benefit, and even the blueness of the skin was not influenced by them.—(*Paine's Letters*, &c., p. 52.)

With respect to the proper treatment in the *febrile stage*, or that of *reaction*, much difference of opinion prevails. One point, however, seems pretty well determined, which is, that venesection is not indicated in the commencement of the reaction. Cruveilhier has, in several examples, seen the reaction cease immediately after a premature bleeding, the patient become blue again, and the collapse return, quickly followed by a fatal termination.—(Op. cit., p. 51.) Bleeding is not advisable till the reaction is complete, free from perspiration, and accompanied by symptoms of congestion in some part or another. Even then, Cruveilhier prefers several small bleedings to a copious evacuation of blood at once. Leeches are safer than venesection, but require caution: after the reaction has become quite established, the editor has often been much gratified in noticing the vast relief of the suffering about the epigastrium, which they give when applied to this region. When put on the temples and forehead, they are also equally beneficial for the removal of the vertigo and headache resulting from the flux of blood to the brain; an object also materially promoted by the application to the shaved scalp of linen wet with cold water, or an evaporating spirituous lotion.

The fever constituting this stage of cholera is usually attended with more or less inflammation, or a great tendency to it in the mucous membrane of the bowels, and often with vast determination of blood to the head. Hence, after the reaction has been fully secured, a free use of the lancet and of local bleeding frequently becomes necessary.*

* Cyclop. of Pract. Med. The editor does not deem it necessary to dwell upon the experiments of transfusion, and of injecting into the veins large quantities of a solution composed of twenty-four grains of carbonate of soda, and ʒij. of muriate of soda in five pints of water. The power of this injection in restoring the pulse and giving the natural colour to the skin, is represented as having been exceedingly prompt, though sometimes transient; so that, on the recurrence of the collapse, it might be necessary to repeat the experiment. With respect to transfusion, it has been most fairly tried both in Europe and America: Dr. Paine observes, "We have nearly abandoned transfusion, from its almost uniform failure. The recoveries, I do not think, have been in the ratio of two to fifty. The temporary effect is very encouraging, but the patients soon die."—Letters, p. 16 and 50. One man laughed aloud from the ecstasy of relief, but was a corpse an hour afterward.—P. 51.

* The ample additions of Prof. Cooper almost supersede the necessity of enlarging on the subject of spasmodic cholera: as the disease, however, has been observed within the last three years by many American physicians, who have contributed to our knowledge of it by a number of respectable publications, we are induced to add a few remarks.

The faculty of the United States, like that abroad, differ in opinion as to the view whether the disease has long been known, or is entirely new. Some of our physicians still debate how far it may be considered as analogous to our indigenous cholera, even when assuming its malignant epidemic form. The distinguished Professor Chapman, of the University of Pennsylvania, affirms (*Am. Journ. of Med. Sc.*, vol. X.), that allowing for the slight modifications which are always impressed on disease by an epidemic influence, the late cholera is essentially the same as our indigenous cholera. The able writer, Dr. Paine, whose work is so favourably noticed by the English editor, expressly states in his Letters (p. 32), "I consider the cholera asphyxia as a nova pestis in Europe and America, and only known in Asia within the last half century. I cannot recognise its parallel in ancient or modern authors. I conceive it to be a fever, of which collapse is the first stage, and reaction the second. The local determinations which arise in the second stage are not necessary to the disease, but are accidental." Professor Ware, of Boston, who visited the cholera hospitals of New-York, thought the disease differed from the character given of it in Europe.—(Boston Med. and Surg. Journal.) Again, Professor McNaughton gives it as his opinion, that this epidemic ought to be regarded as an aggravated form of the common cholera.—(Cholera Gazette of Philadelphia, p. 133.) On the other hand, Dr. J. W. Francis, of New-York, distinctly asserts, that the cholera which he witnessed in that city was an entire stranger in its pathognomonic characters. "In whatever attire it approaches," says he, "you will find it a stranger. Nosology cannot classify a more distinctive disease."—(See Letter on Cholera As-

The restoration of the secretion of bile, and of its transmission into the intestinal canal, continues, however, still to be the main desideratum; and hence the approbation given by some

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phyxia, p. 32.) But we need not enlarge on this head.

The spasmodic cholera appeared first in North America at Quebec and Montreal, in Canada, about the middle of May, 1832; and in the opinion of many who have closely examined its progress, an intimate connexion seems to be traced between its appearance in Canada and its commencement in the city of New-York about the 1st of the ensuing July, where it was extremely malignant, and was attended with great mortality, inferior only to that which marked its career in Canada. In New-York, the last cases of the disease were seen in the first week of November, and full 4000 fell victims to it. In the beginning of August it appeared in Philadelphia, where upwards of 600 cases occurred in the first week. Shortly after, we find it existing in New-Jersey, Maryland, Ohio, Rhode Island, and various other parts of the United States; and the disorder has prevailed so extensively, that its history merely would occupy a volume of no common size. On this subject the American medical journals, and the Cholera Gazette of Carey & Lea, of Philadelphia, may be consulted. In these works the reader will find, among other very valuable matter, the Report of Dr. Samuel Jackson on the Cholera in Philadelphia,—the Letter on Cholera Asphyxia, by Professor Francis,—Dr. Hays's observations on the Pathology of Cholera,—Dr. Eve's Paper on the Asiatic Cholera,—Dr. Henderson's observations on the Cholera at Washington,—the Paper of Dr. Hopkinson, &c &c.

In speaking of this disease as it appeared at New-York in 1832, Dr. Francis remarks, "There is no disorder in the nosology more distinctly marked; there is none less liable to be forgotten, when once particularly observed. The declaration is abundantly verified, that the disease almost always commences with a deranged condition of the digestive organs, such as a disturbed state of the stomach and bowels, sickness, and an uneasy sensation in the whole track of the intestinal canal; vomiting, diarrhœa, pains in and about the epigastric region, a sense of weight, heat, burning with thirst at the pit of the stomach, and a feeling of exhaustion. The tongue varies: it is furred, slimy, pale, leaden, red, and occasionally swollen. Sometimes spasmodic contraction of the abdominal and thoracic muscles occurs. The appetite often not impaired, but digestion laboured and imperfect. These, or a part of these, are by some pronounced the precursors of the complaint. When the disorder is more advanced and deeper seated, we generally find a greater distress of the thoracic and abdominal viscera; the spasms are occasionally of the clonic kind, like those of violent colic. There is greater præcordial weight or visceral fulness. The upper and lower extremities lose their temperature, and become colder as the disease advances; the skin is covered with a cold, raw moisture; the integuments, especially of the extremities, seem shrivelled, or sodden, or water-soaked, or doughy; the tongue is cold, sometimes icy; the respiration is more laboured, and the expired air of a chilly dampness; the eyes are sunken, invested with a dark or livid circle; the pulse, which at the attack of the disorder is sometimes more frequent than natural, is now small, contracted, and, finally, can scarcely, or not at all, be felt at the wrist.

"But we are not to depend upon the regular occurrence of the premonitory evidences of the disease, nor of their going through their entire course, as I now trace them, to a fatal termination. Many cases of cholera have taken place among us, in which the premonitory signs or symptoms were wholly absent, and the complaint has so suddenly invaded, that the stage of collapse has been fully formed within some two, three, or four hours. Nay, death has closed the scene within two or three hours from apparent good health. As in cases of yellow fever, some are violently assailed while walking the streets, or riding on horseback; and I have known three cases of children attacked by the cholera, while in lively exercise at play. A most striking peculiarity of this complaint, in many instances, is, that the intellectual powers, unless overwhelmed by coma, retain their wonted integrity to the last. Often there is an entire absence of all suffering some time before death; and the observation is no less philosophically true than eloquent, that the mind seems to sit unimpaired and serene amid the ruins of organic life.

"I hardly know a greater misnomer of this prevailing epidemic (continues Dr. F.) than the appellation *cholera*. The absence of all bile, either in the ejections by vomiting, or in those from the bowels, is almost pathognomonic: the fluids thus liberated are often brownish, or more frequently colourless, or quite distinct from biliary matter; and if bilious discharges are exhibited, they are among the most favourable circumstances, whether occurring at the invasion of the disorder, or after it has been subjected to the operation of remedial agents. As to the term *spasmodic*, spasm is, perhaps, less frequent in this disorder than in our common cholera morbus. In this opinion I am fortified by the ample experience and observation of my friend, Dr. Hugh McLean, of this city. Spasms do at times occur, and their violence may denote the greater danger of the case; the nervous power being at times rapidly exhausted by their conjoint action, and the causes by which they are induced. Fortunately, in a large majority of instances, these spasms are easily subdued by powerful friction, with potent stimuli. The term *asphyxia* is most consonant to the strongest pathognomonic feature the physician witnesses. This state of asphyxia occurs earlier or later in the progress of the disease, depending upon habit of body, exciting cause, means of relief, &c. I have seen it within a couple of hours from the period of invasion. In some intractable cases it occurs even earlier. This asphyxia seems to me, moreover, to constitute almost the essence of the disorder; for all our prominent indications are to disburden the system of its too deadly grasp, and restore the circulation to its wonted functions. This view of the nature of cholera asphyxia seems to be more clearly established, when we consider the phenomena which the disease exhibits upon inspection after death. Many post-obit observations have been made by physicians of our public institutions, and some few in private practice. The brain has been found surcharged with dark viscid blood; the ventricles, in some cases, containing considerable effusion of serous, occasionally of sanguineous fluid; the membranes often turgid; effusion between the arachnoid membrane and pia mater. Sometimes the arachnoid was deprived of its transparency. In the spinal column were evident traces of previous increased vascular action and effusion. As to the thoracic cavity, the heart and larger venous branches have been found loaded with heavy black blood, often coagulated, and there were at times apparent what the older pathologists denominated polypi. Sometimes the parietes of the heart seemed thinner than natural;

of the most experienced practitioners in this disease to the free exhibition of calomel. The editor has seen more patients saved by calomel, than by any other single remedy. Two grains

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sometimes the heart was found empty, and powerfully contracted. Discolorations or patches were in a few instances seen on the heart, and effusion within the pericardium. I have seen the blood released from the large veins, preserving the tenacity and appearance of a tarred rope. Dr. Depeyre found in a majority of his dissections, that the lungs were collapsed or shrunk, and frequently natural; others have observed them heavier than natural, or gorged with black blood.

"The abdominal viscera evince to a greater extent the influence of diseased action. The mesentery was, in many instances, overloaded with blood. The appearances of the stomach were various; its contents were occasionally a watery, brownish fluid, or a very pale yellow or turbid fluid: sometimes this organ was found empty and contracted. The mucous coat seemed in most instances affected; and cases were not unfrequent when, upon removing the mucous coat, which could often be easily rubbed off, the inner coat was seen surcharged, and its vessels greatly congested. Sometimes the stomach presented appearances similar to those seen in cases where sudden death has been occasioned by drinking cold water in the summer season, a species of stellated inflammation (ecchymoma) if I may be allowed the words, arising, I suppose, from the inordinate action of the organ when its bloodvessels were so unduly injected. I have a drawing of an example of this sort, and it so resembles others in my possession, taken from cold-water cases, that I felt a good deal strengthened in my pathological views by this coincidence. Examples also might be seen where the stomach was entirely unaffected. In two cases which came under my inspection, the subjects of which had died by violent cholera, the superior portions were exsanguine and colourless, the inferior of a deep vermilion colour, and the pyloric portion thickened and contracted. The small intestines were in almost all instances contracted, occupied with air, and their vascular ramifications loaded with dark blood; the duodenum seems especially vulnerable to the morbid cause, the ileum more disgorged than the jejunum, especially its inferior section. All the smaller intestines, I may say, seemed plentifully surcharged, their inner coats softer and paler than natural: rare examples might be found of like morbid changes throughout the whole intestinal canal. The liver was sometimes natural, frequently engorged with dark blood; in several cases the ducts were entirely obstructed or strictured: the gall-bladder was most generally empty, or possessing a small quantity of dark bile: the pancreas bore little or no particular marks of increased vascular fulness: the spleen varied, and was sometimes surcharged."

In many respects, Dr. Francis's account of the morbid appearances on dissection correspond with those recorded by the English editor, as taken from the work of M. Cruveilhier. The autoptic examinations made by Dr. Ferris, principal of the Duane-street Hospital, during the cholera of 1834, are stated to have been as follows: the brain was rarely congested, the arachnoid membrane was occasionally found highly vascular: extensive inflammation was frequently seen in the stomach, more particularly at the pyloric portion: the small intestines were very generally found highly inflamed, and often engorged: the liver rarely affected: the spleen generally natural, sometimes engorged: the gall-bladder often full, containing a dark, olive-coloured bile: the bladder was found entirely empty and contracted, in all who died during collapse: in some cases, when the sufferer had recovered from that state and finally died, some urine was seen. These examinations were all limited to temperate subjects. In some of intemperate habits, occasional appearances of greater local congestion and of more extensive inflammation were seen.

The results of Professor Horner's dissections of cholera cases show, "1st. That the vascular derangements and phenomena of Asiatic cholera, as exhibited in the alimentary canal, are confined almost exclusively, if not entirely, to the venous system. 2d. That in the earlier stages, a lining membrane of coagulating lymph exists in the small intestines at least, if not in the stomach and colon also; and that this lining resembles the membrane of croup. 3d. That in addition to the enlarged and tumefied follicles described by M. Bouillaud, and a similar enlargement of the intestinal papillæ described by M. Serrey, a copious vesicular eruption, entirely distinct from both, and easily distinguished from them, exists on the mucous membrane of the stomach, of the small intestines, and of the layer: and that this vesicular eruption, consisting of small spheres, seldom more than the sixtieth part of an inch in diameter, is probably the essential morbid character of the disease, as is the case with the eruption of small-pox and of other affections. 4th. That the follicular system of the alimentary canal is not the principal fountain of the sero-fibrinous discharges, commonly called the cholera fluid, but that the latter comes from the capillaries of the venous system."—See Am. Jour. of Med. Sc., No. xxx.

In an extremely interesting paper on the cholera, as it appeared in Vienna, in 1831, published in the Boston Medical Magazine, vol. i., No. iv., my friend, Dr. C. T. Jackson, of Boston, has communicated his observations on the morbid phenomena which were seen upon inspection after death. From this valuable paper the following extract is made. "When we examine a corpse dead of cholera," says Dr. Jackson, "we remark a livid purple or blue colour of the skin over the whole surface of the body, but more strongly marked at the extremities; the skin of the fingers on the palmar face is wrinkled, and the tips of the fingers and toes have deep furrows within, produced by this means. The eyes are deeply sunken, and have a dark-bluish black ring round the orbits. The conjunctiva is congested with blood, and has a glassy lustre—the flexor muscles are rigidly contracted, the tendons standing out prominent on the extremities; the hands are firmly clinched, requiring an effort to open them. Tongue covered with a brown slimy coat; mucous membrane of the mouth covered with an adhesive mucus—uvula, tonsils, and pharynx covered with granulations, as is likewise the base of the tongue. These granulations vary in size from that of a peppercorn to that of a pea, and are probably the mucous follicles altered by inflammation. They contain a yellow pus of more than ordinary consistence. Œsophagus corrugated. Mucous membrane of the stomach often thickened, and is of a delicate pink colour, or is brownish yellow, with spots of redness, as if from recent inflammation. These red spots have often little rounded vesicles of the shape and size of half a pea, projecting from the centre, which contain a liquid pus. We noticed the presence of vesicles in three instances in the stomach, where we first discovered them. Afterward we found them very common in the whole track of the small intestines, but did not find them so frequently in the

may be given every three or four hours, and, if assisted with some gentle laxative occasionally, as carbonate of magnesia, castor-oil, or the effervescing saline mixture, this medicine will soon restore to the fecal evacuations their healthy quality.

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stomach. These vesicles are probably mucous follicles altered by inflammatory action. Stomach and intestines are filled with a turbid liquid like rice-water, with little flocculi of a white membranous substance floating in it. The fluid in the intestines is coloured more or less by fœcal matter and bile.

"The glands of Peyer are enlarged in cases where the disease has been protracted into the typhoid state. The glands of Brenner are often in these cases rendered visible, are large as peppercorns, and have black points at their centres. Valvulæ conniventes of the duodenum, flaccid, thickened, and swollen—covered with the little vesicles before mentioned—more rarely they are ulcerated. Peritoneum dry, adhesive to the touch, and has a shining opaline lustre. The bile-ducts are often thickened, but are generally open. Liver dry; gall-bladder filled with a brownish liquid bile. Spleen small, flaccid. Heart large, flaccid, soft, easily torn by the fingers—contains blood in all its cavities. The blood is imperfectly coagulated, resembling thick molasses. It adheres to the surface of the heart, and gives it a dark colour. The blood is black, or venous blood, in both ventricles and auricles. The *pulmonary veins contain clots of yellow coagulated lymph*, tremulous like *jelly*. Mr. Wagner considers this a peculiar phenomenon. The state of the blood is like that I have observed in persons dead of diabetes mellitus. Is it not the effect of a drain of serum from the blood during the vomiting in cholera, and by urine in diabetes?

"In the organs of respiration we find the trachea containing frothy mucus of a brown colour. Vocal cords of the larynx flaccid, sometimes thickened. Mucous membrane of larynx sometimes red and congested. Lungs somewhat contracted in volume, are tough and leathery to the feel, but *crepitate well*, and *never contain tubercles*. Kidneys have the veins full of uncoagulated blood. Bladder firmly contracted in a small mass beneath the pubes. It is generally empty, or contains a drachm of opaque liquid. Brain has the sinuses engorged with uncoagulated black blood. The cerebral mass firm, tough, and dry. In cases where the disease was of a long duration before death, we found the brain congested. This was peculiar to the typhoid state. Medulla oblongata firmer than ordinary, and contracted in volume. Medulla spinalis congested with blood from gravitation after death. Semilunar ganglion was found sometimes enlarged, of a deep red colour; and sometimes softer than natural: the state of this ganglion, however, varied so much, that I can give no precise account of its morbid anatomy. It is obvious the changes of colour in this ganglion might have been the effects of the change in the colour of the blood. But little is known of the morbid anatomy of the ganglionic nerves, and we have no data on which to found our comparisons—hence it is difficult to say what part their lesion might have performed in the cholera."

For farther interesting views of the morbid appearances of cholera, see Cases of Cholera collected at Paris, in April, 1832, in the wards of MM. Andral and Louis, at the Hospital La Pitié, by James Jackson, jun., a young man of great promise, and the pamphlet of Dr. Ashbel Smith, of North Carolina.

The methods of treatment pursued by practitioners in the United States, differ as much as their pathological views of the nature and character of this malady. The early use of the lancet in the incipient stage of the disease has been urged by many, and some have recommended it even in the collapsed state: others proscribe bloodletting altogether: there is probably error in both these extremes. Dr. Ferris found the lancet an admirable aid in many cases of the forming stages of this complaint in 1834. A very eminent physician of Mississippi, Dr. Cartwright, tells us that he used freely calomel, camphire, and cayenne pepper with great success: he also states, that he had recourse to bleeding, if there was local distress in the head.—(See Additional Observations, &c., Natchez, 1833.)

In short, the opinions of American physicians on the subject of bloodletting correspond with those expressed in the late Croonian lectures delivered by Dr. Roupell of London. Speaking on this subject in general terms, he remarks, "Venesection, of all remedies that have been recommended in cholera, is that which is most confidently spoken of, and which is supported by the best authorities. Sure, in common with other remedies, bleeding is said to have had its failures."

In regard to the further treatment of this disease Dr. Francis remarks, "You may distinctly observe three stages in the complaint: first, that which embraces the forming or premonitory symptoms, such as I have already stated; more or less of these will invade every subject, and they will vary in force in different individuals, and be modified by accidental circumstances. The second stage constitutes that period when the disorder is further advanced, when the visceral congestion has taken place, accompanied perhaps by spasms, oppression of the intellectual faculties, and a tardy circulation. The third and last stage is that of collapse, frequently, alas! the fatal stage. Accordingly, therefore, as our means of relief are applied to these different stages, will they more or less differ. In the first or forming stage, attention to the primæ viæ, relieving the bowels of their wonted crudities, and adjusting the common functions of the system, are the objects to be fulfilled. A dose of castor-oil, repeated perhaps, the administration of the common eccoprotic mixture of rhubarb, magnesia, and mint-water, or a liberal dose of calomel with a few grains of aloes, or jalap and crem. tart. may suffice. Hundreds of cases, in the incipient form of cholera, have by these means been arrested; and we are further to remember, how essential it is that the feculent discharges should be restored to their ordinary natural character. In the second stage, that of congestive formation, while we attend to the condition of the primæ viæ, let us not forget the importance of bloodletting, the internal use of calomel, blended at times with very small doses of opium, when irritability of the stomach, a tendency to spasm, or other morbid symptoms, point out the combination, the application of blisters to the abdomen, or sinapisms largely applied over the epigastric region; tepid fomentations up the bowels, by means of enemata of water, catnip tea, &c.; the free use of frictions of a stimulating nature, renewed again and again, to restore the harmony of the circulation, diminish coma, and relieve the labouring viscera. In the third stage, that of collapse, all our efforts will too often prove unavailing. Yet the success which has resulted, in numerous instances, even in so discouraging a state, justifies the physician in assiduous perseverance. Some prescribers, even in

Too often, however, whatever treatment be pursued, the reaction is either incomplete, or brings on inflammation at various points of the system, leading to a fatal result, either in its acute or chronic form. Hence, as Cruveilhier remarks, the prudence of employing internal stimulants and emetics with moderation. In other instances the patient dies in a comatose or typhoid state, and numerous are the practitioners who have repented of having exhibited opium too freely in the cold stage. This species of cholera is not exempt from peril even in the period of convalescence, and after the patient has got through the cold and febrile stages, he frequently falls a victim to the slightest error of regimen.*

this state, have recourse to the lancet; if blood can be drawn from the arm, this is a reason for persisting in the attempt: in despite of the most disheartening prospects, by local hot bathing, or by frictions, the blood has at length flowed, the pulse relaxed, the heart been relieved, and the circulation restored. But this happy event is of rare occurrence; the cerebral congestion, the abdominal fulness and tension, and perhaps pain, upon pressure, now call in, as proper auxiliaries, leeching, cupping, followed by the extensive application of mustard and vinegar cataplasms to the bowels and feet, bottles of hot water to the feet, almost unremitting efforts in exciting the surface, by frictions with warm flannel or the flesh-brush: and among the liniments now most employed, are the two following—equal parts of brandy, camphorated spirits, and cayenne pepper; or spirits of turpentine, camphorated spirits, and cayenne pepper: the body in general, and the superior and inferior extremities, are to feel the effects of a free attrition with the liniment, renewed at short intervals: some use hot vinegar and cayenne pepper—others freely aq. am. Dr. Roe, of the Greenwich hospital, instead of these means, employs very generally, mercurial ointment, with camphor and cayenne pepper. The prescription is as follows: Ung. mercur. one pound; pulv. capsic. ann. four ounces; camphire eight ounces. He rarely uses internal remedies.

"As a means of quickly rousing the cold surface, and acting on the deserted capillaries, Dr. Dekay uses, and, I am informed, with happy effect, equal parts of cayenne pepper and camphire; and lard, blended with a moderate quantity of muriatic acid, as a rubefacient, is reported to be very rapid in its action. The actual cautery has been applied, and some have had the temerity to make use of enemata of tobacco. I do not think that due value has been placed upon the use of copious intestinal injections of warm water, with or without salt, in the different stages of the disease. I have used most freely, in the collapsed stage, the liniment of turpentine, camphire, and tincture of capsicum, sometimes with cajeput oil, tincture of flies, &c. and in several appalling cases in this stage, with entire success.

"Some of our physicians, imbued with the Broussaian doctrines of disease, urge, as the most efficient cure, the liberal application of leeches, and the internal use of ice. The application of leeches, either to the head or to the abdomen, or to both, provided their employment be timely, must be beneficial; and ice, in small quantities, repeatedly taken in the manner of pills, has in a number of instances allayed very irritable stomachs, and proved salutary in diminishing that inordinate burning and thirst which some patients suffer. But this practice, however, is not energetic enough, and I apprehend few severe cases of cholera, much less those of approaching collapse, have been cured by it.

"There is a state of reaction which occurs in some instances," adds Dr. F., "when the patient survives the collapsed stage, which much resembles a depressed, continued fever: the coma, the suffused countenance, the slight febrile heat, restlessness, pulse, &c. sufficiently designate it. I need not dwell on the treatment. In this consecutive fever, which is often greatest where internal stimuli have been injudiciously used, bloodletting or cupping may be advantageously employed: the alvine excretions are to be removed, which are often enormous in quantity, and offensive, and the case subjected to the common principles of cure. In this sequela there is great debility, which will often continue ten or fifteen days."

When speaking of the treatment by injecting saline solutions into the veins, Dr. Francis remarks, "Of about forty-two subjects, in which our practitioners have had recourse to this method of treatment, four only, as far as I can learn, have been thereby saved. Two of these successful experiments were made in the Crosby-street hospital, under the charge of Dr. Rhinelander, where, I believe, thirteen cases have been tried. In the first successful one forty ounces were injected, of a solution composed of the carbonate of soda one drachm, of muriate of soda two drachms, dissolved in six pints of water. The patient was a female, in the collapsed state. In the other successful case, a female, in like hopeless condition, had a similar injection, to the extent of one hundred and five ounces. The largest quantity of the saline injection that has as yet been introduced by Dr. Depeyre, by whom the two fortunate experiments were made, was three hundred and thirty-two ounces. The injection was made of the temperature of blood warmth, or rather higher, and introduced into the median cephalic vein. From the examples which I have seen of this practice, I should deem it justifiable only in the extreme instances of collapse, when every other prospect of cure was lost. In such forlorn condition the saline injections are fully justifiable."

On this subject Dr. Vaché, of New-York, very properly observes, in his letter to Dr. Francis,—(U. S. Med. and Surg. Journal, vol i., No. 2, p. 50) that "this remedy became a powerful auxiliary to a speedy recovery, provided the sudden and violent reaction induced be energetically met by corresponding antiphlogistic means."—D.

* Cruveilhier makes some very judicious reflections on this part of the subject.—Anat. Pathol., livr. 14me., p. 52.

GENUS X.

ENTEROLITHUS.

INTESTINAL, OR GASTRO-INTESTINAL, CONCRETIONS.

STONY CONCRETIONS IN THE STOMACH OR INTESTINAL CANAL.

WHATEVER be the degree of merit or demerit that belongs to this genus, the author suspects he must take to his own share; since, so far as he knows, it is yet new to the domains of nosology.

In treating of the genus COPROSTASIS, we had occasion to observe, that the natural feces, under circumstances there explained, become at times indurated, shrivelled, and broken down

into small balls and buttons, as hard as sun-burnt clay, occasionally intermixed with mucus, or oleaginous matter. And, in treating of colica, we referred to concretions of a still harder substance, and of a stony appearance, which, though formed in the intestinal channel, are compounded of other materials than the constituent principles of fæces.

It is for the purpose of including substances of this kind, and which are of very different descriptions, that the present genus has been devised, whose name, ENTEROLITHUS, or INTESTINAL CONCRETIONS, sufficiently indicates a comprehensive scope.

We have, indeed, on various occasions, had to give a casual glance at this subject before; and we have particularly observed, that almost all animals are endued with a power of separating or secreting lime and other earths from the blood for particular purposes, as that of forming a shell-covering in insects and worms, and of giving hardness to the bones in all other animals. Under a morbid action of single organs, or of the system generally, this secretion often takes place in an undue abundance, and is poured forth into cavities where its accumulation and crystallization must be attended with mischief. Such, at times, is the case in respect to the stomach and intestines. But, independently of concretions derived from this source, we often meet with others, produced by an agglutination or crystallization of substances which are contained in the aliment, and which, not unfrequently, give immediate proof of their origin by the aromatic taste, smell, or other qualities which they exhibit. There is also a third species of concretion, occasionally to be traced in the alvine channel, of a harder or softer structure, and of a cetaceous or saponaceous feel, which consists of feces, or the refuse matter of the chyle, more or less combined with oil or mucus, and sometimes consisting almost entirely of the two last.

As the subject has been never before pursued with a view to any critical examination or systematic arrangement of the tribes of substances that appertain to it, we have not yet perhaps arrived at a knowledge of all their different forms or combinations, as met with in the intestines of man, or the animals of the mammalian class, to which man is degraded by Linnæus: but we may at least venture upon the three following, each of which will furnish a distinct species:—

1. Enterolithus Bezoardus. Bezoar.
2. ———— Calculus. Intestinal Calculus.
3. ———— Scybalum. Scybalum.*

* Intestinal concretions, in relation to their origin, may be divided into three kinds. The first are not formed in the alimentary canal, but pass into it from some other part, as the liver or gall-bladder, and then undergo more or less modification. The second are only partly formed in the alimentary tube; they have a nucleus, usually something that has been swallowed, round which a certain number of principles contained in that tube accumulate and crystallize. The third are entirely produced in the alimentary canal itself. To the first kind must be referred the calculus found by Dr. Marcet in the rectum of a child which had an imperforate anus, but between whose rectum and bladder an open communication existed. The foreign body consisted principally of phosphate of lime and the ammoniaco-magnesian phosphate.

Whatever may be the origin or composition of intestinal concretions, the irritation arising from them is apt to bring on eructations, frequent vomiting, constant pain and oppression about the præcordia, loss of appetite, constipation, and almost total loss of sleep; and a gradual impairment of the health. In some instances diarrhœa prevails: the result may even prove fatal. One remarkable case of this kind is on record, where, after the death of a patient, a boy eleven years old, a calculous concretion was detected at the union of the ascending and transverse portions of the colon. It was six inches long; weighed twelve ounces and a half; was enveloped in mucus; and consisted of three fragments articulated, as it were, with one another. A hard tumour was felt in the right hypochondrium while the boy lived, but it was supposed to be the liver.—(See Edin. Med. and Surgical Journal, July, 1825.) The bad symptoms occasioned by intestinal concretions may continue until the foreign bodies are expelled. In certain cases, the complaints produced by them are ascribable to the manner in which they mechanically block up the pylorus or the intestines.—ED.

SPECIES I.

ENTEROLITHUS BEZOARDUS.

BEZOAR.

FOUND IN CONCENTRIC LAYERS, CLOSELY AGGLUTINATED OR CRYSTALLIZED; CAPABLE OF A FINE POLISH; FREQUENTLY WITH A METALLIC LUSTRE ON THE SURFACE OF EACH LAYER, AND AN ACCIDENTAL NUCLEUS IN THE CENTRE; OF A SPHEROIDAL FIGURE: CHIEFLY CONSISTING OF VEGETABLE MATTER.

BEZOARDUS, or bezoar, is derived from the Persian compound *Padi-zeher*, or *Pad-zehr*, corrupted into bedzohr, and bezoar. Literally translated, it is *depellens venenum*, and consequently a direct synonyme with the Greek term alexipharmic.

It is found occasionally in the stomach of some of the camel tribes, but more frequently in that of the smaller ruminating quadrupeds, as the goat, and two or three species of the antelope genus, as the chamois, or *wild-goat*, as it is sometimes incorrectly called, (*the antilope rupicapra* of Linnæus), and especially that beautiful and elegant animal, the *gazhal* (*antilope gazella*, Linn.), the tzebi (צבי) of the Hebrew poets, or *roe* of our Bible versions.

The bezoar was formerly employed as a febrifuge and alexipharmic in medicine, and worn as an amulet by the superstitious, who have sometimes purchased a single one from the east at six thousand livres when very fine, and hired them in Holland and Portugal, on particular occasions, at a ducat a day.

It is not quite satisfactorily ascertained, that this species has ever been found in the human stomach; we have, indeed, assertions to this

effect in various foreign miscellanies,* and I have hence introduced it into the present place. But it does not often appear that the substances referred to were examined with sufficient attention, while the authors seem to have used the term bezoar in a very loose and indefinite sense. In one of the volumes of the Annales de Chimie, however, the analysis seems to have been scientifically conducted. It was made by M. H. Bracconot, from a quantity of concrete materials voided by a female under the care of Dr. Champion, of Bar-le-duc, which were found to be genuine bezoars.—(*Annales de Chimie*, tom. xx.)

The bezoar, as already observed, is chiefly obtained from the stomach of the smaller ruminating animals, whose food, from the complexity of the organ, lies for a long time quiescent in a state of subaction, and is thus enabled to give forth the whole of its juices under circumstances that afford them a much easier opportunity of agglutinating or crystallizing than in many other animals. In the goat kind, these concretions are called ægagropilæ; a Greek term, signifying mountain-goat balls. They are of different sizes and figures, the last being chiefly determined by the nature of the nucleus, which, in different individuals, is marcasite, talc, flint, gravel, straw, glass, seeds of plants, &c. In colour they are white, yellow, or brownish; that of the gazhal is greenish blue; and, when recent, highly aromatic, from the odour of the plants on which the animal feeds. The most singular circumstance belonging to them, is the bronze or metallic lustre that appears on the surface of the different layers, and does not strike deeper than the surface. This, however, is said to be a property peculiar to the western bezoar, and seldom or never to be found in those of the east, which are often of as beautiful a glossy white as ivory. Daubenton ascribes the gilt appearance to a vegetable die, fixed by the tartaric acid of the plants in which the die exists; and observes, that he has remarked a like appearance on the grinding teeth of many of the ruminating tribes. A few of them rattle on being shaken, the nucleus having contracted and become loose. La Fosse (*Cours d'Hippiatrique*, p. 158) asserts, that he has occasionally met with genuine bezoars or ægagropilæ in the stomach of the horse; and similar concretions seem at times to be formed out of the animal body, as tubercles to the roots or other parts of certain plants; for Fourcroy affirms, that, in the cabinet of Jussieu, he was shown some curious bezoars of the oriental appearance, white or yellowish, glossy as ivory, and of a spheroidal figure, which were said to be produced by the cocoa.

From the supposed value of bezoars in medicine, they were at one time imitated, and the false sold as genuine. These supposititious stones, according to Bomare, were compounded of lobsters' claws and oyster shells, levigated on porphyry, made into a paste with musk and ambergris, and formed into balls of the shape of bezoars; and, where the metallic lines were aimed at, afterward rolled on gold leaf. The pierres de Goa, or de Malacca, as they were called, were, at least generally, factitious bezoars of this kind; and their spuriousness was capable of proof, by drawing a line with them on a piece of paper previously rubbed over with ceruse, chalk, or lime; the line of the genuine bezoar turns greenish, or of an olive yellow; that of the factitious remains unaltered. The imposition, however, seems to have been very unscientific, as formed principally of earths, instead of being elaborated from crystallized vegetable juices, which produce this change of colour

* Samml. Med. Wahrnehm., b. ii., p. 418. Ferri, Galeria de Minerva 1696.

SPECIES II.
ENTEROLITHUS CALCULUS.
INTESTINAL CALCULUS.

RADIATING FROM A COMMON CENTRE, OR FORMED IN CONCENTRIC LAYERS; MOSTLY WITH AN ACCIDENTAL NUCLEUS; MORE OR LESS POROUS; SPHEROIDAL OR OBLONG; ADMITTING AN IMPERFECT POLISH; COMPOSED CHIEFLY OF EARTHS AND ANIMAL MATTER.

This species is by no means unfrequently found in the human stomach and intestines, but far oftener, as remarked above, in the digestive channel of other animals, and particularly in the larger ruminating quadrupeds, or those with a long complicated digestive organ, where the food, as in the formation of the bezoars, is slowly carried forward; and in tardy draught-horses, particularly those of millers, that are fed largely on bran, which seems to yield a ready basis for these concretions.* In Dr. Watson's case, the disease had existed for years: the animal died, aged twenty-two, near foaling; but gave no sign of pain or inconvenience till three months before her death. The calculus weighed 15lb. 12oz.; average diameter 8½ inches by 8 inches.

When chymically analyzed, they are chiefly found to consist of a triple or ammoniaco-magnesian phosphate, like the earthy or white-sand calculi of the human bladder; though it is difficult to conceive from what quarter the magnesia is obtained. In the case of millers' horses, some portion of this earth may perhaps be derived from the bran, in which it is always to be traced; but the difficulty still remains with respect to other animals. The figure, whatever be the size of the calculus, is usually spheroidal, except where broken into separate fragments: the matter is deposited for the most part as in the former species, upon a nucleus of some sort or other; as a small piece of flint, an iron nail, a seed or husk, a piece of hay or straw, a bit of bone, with blood originally effused round it (*Laugier, in Mém. de l'Acad. Royale de Méd.*, t. i.); the structure sometimes radiating from

* Phil. Trans., xxiv., 1705, Thoresby. Id., xliv. 1746, Bailey. Id., xlviii., 1745, Watson.

such common centre to the surface, and sometimes evincing distinct plates, more or less united to each other.* In the human subject, these calculi vary from the size of a pea to that of a filbert, chestnut, or hen's egg, and are often still larger.† In the case of Margaret Lawer (related under *Colica constipata* (*Ut suprà*, p. 124), they were usually of the two former sizes, and appear to have been formed in great abundance, and with wonderful facility; for her abdomen, upon pressing it, often rattled, from the quantity it contained, with the sound of a bag of marbles. Many of these were rough and sharp-pointed at the edge, evidently fragments or nodules of larger concretions, and gave great pain in the rejection, whether above or below, for they were discharged both ways. The larger-sized weighed rather more than two drachms; and Dr. König, who relates the case, calculated that the whole that were discharged, during the continuance of the complaint, could not amount to less than 5 lb. avoirdupois. In a case related by Mr. Martineau (*Phil. Trans.*, vol. xxxii., 1722–1723), some of them, much larger than the preceding, were voided *per anum*, by a poor woman in the third month of pregnancy, after having suffered from colic about four or five days: of these, the largest, 8 inches in circumference, and 6¾ inches in length, weighed two ounces, 16 pennyweights, and 12 grains. In this case, and in various others, the calculi seem to have been in the intestines for a considerable period of time without inconvenience; for it is hardly possible to conceive that all these should have been produced in the course of a week. In another case, in the same journal (*Phil. Trans.*, vol. xli., 1739–1741), a calculus of this kind was extracted with some difficulty from the anus by the surgeon who attended, which weighed eight ounces and a half, and was ten inches and a half in circumference. It is described as "a hard, unequal, ragged, flinty stone," but was not examined chymically. It had been in the pelvis, and nearly of its full size, for several years before its extraction; for the patient's stools were always obtained with difficulty; and three children, which she had successively borne in the three preceding years, were all marked with a large hollow or indentation in some part of the head; in one instance, of sufficient extent to hold the moiety of a small orange.

Other examples, however, have occurred, both of as large a size, and of as firm or flinty a crystallization. Thus, in a foreign miscellany of authority, we have the case of a calculus discharged by the anus of half a pound weight (*Samml. Med. Wahrn.*, band ix., p. 231); and M. Daubal has published a full account of fragments of stony calculi (*saxea fragmenta*) evacuated from the same organ (*Discursus Academicus de Esthera Norra.*, Lund., 1715, 8vo.); as Sir H. Sloane has another case, in which the concretions amounted to two hundred.—(*Birch. Hist.*, 1685.)

In draught-horses and oxen, this species of calculus is generally found single and much larger, and often of little inconvenience for years. They vary in size from 3 lb. avoirdupois to 10 or 12. Of this last weight, the author once met with an instance in a horse belonging to Mr. Hayward, a respectable miller of Brundon, near Sudbury, in Suffolk; and Mr. Watson gives an account of two considerably heavier, one already noticed, and the other weighing 19 lb., exclusive of the outward shell or crust, which was broken off in several pieces, with a circumference of 28 inches. Both these were laminated, but "had the appearance of a pebble; yet the specific gravity was much lighter, the first weighing in water not more than 6 lb. At other times, the crystallization is more like that of gneiss, or of grit-stone, and almost always light and porous."*

Occasionally, however, this species is found gregarious instead of solitary. Mr. Watson, in the article just quoted, mentions a case of *several* found in the intestines of a mare, and presented to the Royal Society by the Duke of Richmond, in 1746, the nucleus of two of which was found to be an iron nail. And by turning to another volume of the same journal (*Phil. Trans.*, vol. xliv., 1746), we find these calculi described by Dr. Bailey (for the two articles appear to relate to the same case) as consisting of five in number, of different sizes, some triangular, and resembling a horse-bean, of an olive colour, and finely polished; and one much larger, weighing nearly 16 oz. troy, and measuring 12 inches by 11.

Several of these concretions, we have observed, had the appearance of crystallized gneiss, or of grit-stone; and it is probable that they were partly of these very minerals; for it is of such that millstones are very generally composed; and by the friction they are perpetually undergoing, there can be little doubt that much of the milldust, intermixed with bran, with which millers' horses are fed so largely, is derived from the powder furnished by these stones.

In man, the calculus often depends upon a like accidental origin; for it not unfrequently follows upon a long, free, and injudicious use of prepared chalk, magnesia, or other calcareous earths, for the purpose of correcting acidity in

* A female child swallowed a pin, which was not voided from the bowels till she attained the age of eighteen, when its head and one half of the other portion of it was found enclosed in an earthy concretion.—(North American Journ., 1827.)—ED.

† Those of considerable dimensions may cause hard swellings in some of the abdominal regions very manifest to the touch, and sometimes even to the sight.—See Edin. Med. Journ., July, 1825; and Archives de Médecine, t. ii., p. 148.

* Phil. Trans., vol. xxxiv., No. 398. In the centre of a calculus taken from a horse, and consisting of phosphate of lime, MM. Laugier and Lassaigne found a large quantity of straw, around which the earthy matter had been deposited.—See Andral, Anat. Pathol., t. ii., p. 166. In the intestines of cows, and some other animals, balls of hair are common enough. They lick their hairs, and a portion of these, being swallowed, concrete into hard balls, cemented with phosphate of lime and mucus.—ED.

the stomach.* I have known this happen in many dyspeptic cases; and once attended a lady, who, from the same cause, laboured under a most painful constipation, till a large mass of what may be called intestinal mortar was removed by a scoop from the rectum. The case related by Dr. S. Fitzgerald, of Mullingar, was apparently produced by a like cause. The lady had suffered great torture in the hypogastric region, particularly towards the back and os sacrum, for eighteen months; during the last three of which she could not leave her bed, except for tepid bathing, which afforded her transient ease. Upon the rejection of an emollient anodyne clyster, she discharged with it a large hard calcareous ball, of an oval figure, weighing eight ounces and three drachms, exceeding in size an ordinary orange, and so solid that nothing less than the stroke of a hammer could break it. A total liberation from pain immediately followed, and the patient progressively recovered.†

The curative process may be comprised in a few words. If the concretions proceed from an injudicious use of calcareous or magnesian earths, both these must be avoided for the future: and the calculi actually existing be diminished in their diameter by the use of mineral acids, and quickened in their passage by cathartics. If magnesia be the agglomerating base, the sulphuric acid will be preferable, as this will have a tendency to convert it into Epsom salts, and thus produce a purgative as well as a solvent effect. [The state of the rectum should always be ascertained, and by throwing a clyster up it, it will generally be easy to learn whether any obstruction exist within it; or, if requisite, an examination may be made with the finger or instruments. It is not at all uncommon for the concretions to pass as far as the rectum before they stop.]

If we have reason to suspect a calcareous diathesis as a sole cause, since this diathesis usually depends upon debility, we must endeavour to invigorate the system generally, and the stomach more particularly, by the course of regimen and medicines already prescribed under Dyspepsy.—(*Marcet, Essay on Calculous Disorders*, 1817.)

SPECIES III.
ENTEROLITHUS SCYBALUM.
SCYBALUM.

CONCRETION SOAPY OR UNCTUOUS; MOSTLY CONTINUOUS; SOMETIMES IN LAYERS; SPHEROIDAL OR OBLONG; CONSISTING CHIEFLY OF MUCUS OR OLEAGINOUS MATTER, MORE OR LESS INTERMIXED WITH INDURATED FECES.

This species has not hitherto been sufficiently attended to; and even Fourcroy and Walther seem to have mistaken it for a biliary calculus; an error which the writer has seen in several instances repeated in this metropolis. The specific character sufficiently expresses the general nature of the concretion, and is drawn up from various examples that have occurred to himself, or have been shown him by others.

The concretions belonging to this species, if carefully watched and analyzed, would probably be found very numerous; but in the present state of our knowledge upon this subject, we must confine ourselves to the three modifications of feculent, oleaginous, and ambraceous, or that of ambergris.

When, from a feeble peristaltic action, the feces have remained long in the colon, they are frequently found to undergo a considerable change; for they become harder as their more liquid parts are absorbed; and in consequence of becoming harder, frequently stimulate the mucous glands, by which they are surrounded, to a more copious secretion, which intermixes with them; and, as they break into indurated balls or fragments, gives them a less rough, or a more greasy or unctuous feel. These are the common scybala of medical writers.

But we occasionally meet with balls, buttons, or globules of a still more cetaceous, fatty, or oily substance, discharged, sometimes solitarily, sometimes gregariously, from the rectum, of very different diameters.* Occasionally we can trace them to a like origin, as in a case quoted by Sir Everard Home (*Phil. Trans.*, year 1813, art. xxi.), from Dr. Babington, in which the lady who voided them had regularly, before their appearance, taken one or more

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* In some instances, carbonate of iron has accumulated in the bowels, and produced concretions. Hence, when this medicine is given, Dr. Elliotson recommends particular care to be taken to keep the bowels open; if you attend to this point, an immense quantity of the carbonate of iron may be given without inconvenience. The same physician relates a case of tetanus successfully treated, where a man took nearly two pounds of it every day for some days, and he regularly voided large lumps of it, clysters being given to make their passage free from pain. Dr. Elliotson had another patient labouring under tetanus, to whom he gave this remedy also with success; but if purgatives were not regularly administered, pain was experienced in the rectum from the accumulation of the iron in it, which required to be picked out. Some years ago, when it was the fashion to cram the alimentary canal with mustard-seed to obviate costiveness, considerable masses of it frequently collected in the bowels, and produced serious disorder.—Ed.

† Edin. Med. Com., vol. viii., p. 329. Among the poor in Scotland, who eat oaten bread, Dr. Marcet found that intestinal concretions occur, with a nucleus of vegetable fibres, manifestly consisting of oats. An analysis of one of these concretions furnished of

Animal matter, - - -	25.20
Resin, - - - - -	3.90
Ammoniaco-magnesian phosphate,	5.16
Phosphate of lime, - -	43.34
Vegetable fibre, - - -	20.30
	97.90—Ed.

* A phthisical girl voided from the bowels numerous concretions, which were found by M. Lassaigne to be composed as follows:—

1. Acid fatty matter, - -	74
2. Matter analogous to fibrine,	21
3. Phosphate of lime, - -	4
4. Chloruret of sodium, - -	1—Ed.

doses of olive-oil to appease severe pains in the stomach, which were ascribed to the passing of gall-stones, for which these concretions were at first altogether mistaken. They were of a globular form, "varying in size from that of a small pea to the bulk of a moderate grape, of a cream colour, and slightly translucent, of a sufficient consistence to preserve their form, and to bear being cut with a knife like soft wax."

In general, however, we cannot trace these concretions to any unctuous material introduced into the stomach; and have reason to believe them produced by intestinal secretion, or a chymical change effected on the recrement of the food after it has passed into the larger intestines. Dr. Babington has also furnished, in the same article, a case, which can only be resolved into an origin of this kind. The patient was here a little girl of four years and a half old. At the age of three, "her mother observed something come from her as she walked across the room, which, when examined, was found to be fat in a liquid state, and which concreted when cold. Ever since that time to the present she has voided, at intervals of ten or fourteen days, the quantity of from one to three ounces, sometimes pure, at others mixed with feces: when voided, it has an unusually yellow tinge, and is quite fluid like oil. Her appetite is good, as well as her spirits, and her flesh firm; her belly rather tumid, but not hard: she is subject to occasional griping."—(Loc. cit.) A free evacuation of the same kind occurred to Dr. Kuntzmanz of Berlin.—(*Journal der Practischer Heilkunde von Hufeland*, July, 1821.)

Globules, and balls of fat, discharged from the rectum, are noticed in various medical collections of high authority, both domestic and foreign.*

Thus, in the Edinburgh Medical Essays, we have an instance of a whitish substance like tallow or hardened marrow, being a congeries of globules, passed among the excrement, the entire mass making the size of a walnut; other masses having been passed several days afterward of the size of so many peas.—(Vol. i., part. ii., art. lxvi., p. 145.) The Paris Academy of Surgery have published similar accounts.—(See *especially Hist. de l'Acad. Royale de Chir.*, iii., p. 14.) So Dietrich gives the case of a waxy mucous matter—materia ceracea mucosa—passed by the rectum, weighing more than an ounce (*Observations*, &c.); and Paulini notices several instances that had fallen within the range of his observation (Cent. i., obs. 15); in one of which the concretions were of a green hue. Vander Wiel describes a case of the same appearance (*Stalpart Vander Wiel*, cent. i., obs. 61); and Zeller has found them loaded or covered with hairs (*Dissert. Molæ viriles memorab.*, Tubing., 1696), probably swallowed accidentally. So in the Acta Naturæ Curiosorum (vol. iii., obs. 51), we have an instance very like the first of Dr. Babington's cases; the concretions were dejected in a paroxysm of colic, and are described as "excreti globuli, quasi saponacei, cedente dolore hypochondriorum." And I suspect we are to refer to the same species a case ascribed by Dr. Scott, of Harwich, Roxburghshire, to hydatids, or something resembling them.—(*Edin. Med. Comm.*, vol. v., p. 183.) The patient had for many months been occasionally subject to colic and dyspeptic affections, accompanied with great pain and faintness. He at length "began to void by stool substances of a brown colour, some about the size of nuts, and some as big as walnuts, which were bags that contained matter of a yellow hue like pus, besides a great many empty ones that had broken. I have seen eight or ten passed in one stool." This continued for eight or ten days, and the patient then recovered.

In all these cases we find proofs of morbid intestinal action, commonly accompanied with pain and *coprostasis obstipata*, or costiveness from weakness and torpitude in the vermicular movement of the intestines.

It is under like circumstances that the substance called ambergris is found in the larger intestines of the cachalot, or spermaceti-whale (*physeter macrocephalus*, Linn.), which generally contains sixty per cent. of fat, and is never higher up than six or seven feet from the anus. It appears to be more completely elaborated in proportion as the animal is more sickly and affected with costiveness, and does not dung on being harpooned; and hence the most valuable, according to the report of the South Sea whalers, is that which is extracted from animals that have died of the complaint. It is found in masses of from fourteen to more than a hundred pounds weight; and appears at first to bear a close resemblance to the feces of the whale, but hardens on exposure to the air. The largest lumps have probably not been discharged, but separated from the body of the animal during the process of putrefaction after death. Neumann gives an account of one mass found on the coast of the Island of Tidor, that weighed not less than a hundred and eighty-two pounds.—(*Phil. Trans.*, vol. for 1734.) It was purchased of the King of Tidor, by the Dutch East India Company, in 1693, for eleven thousand dollars, and measured five feet eight inches in thickness. It was long exhibited at Amsterdam, and at length broken up and sold. Other masses of many pounds weight have been found floating on the sea: and the concretions, thus detached and of different bulks, are carried into every quarter by the tides and currents, and have sometimes been found on the shores of the West Indies; whence Waller:

"Bermuda wall'd with rocks, who does not know
That happy island where huge lemons grow?
Where shining pearl, coral, and many a pound,
On the rich shore, of AMBERGRIS is found."

Sometimes, however, it is traced in great abundance in the intestines of whales that are harpooned, and which, probably, would soon

* In the last volume of the Medico-Chirurgical Transactions, Professor Elliotson has published a valuable paper, containing all that is at present known respecting the discharge of fatty substances from the bowels. The reader will find an abstract of it in the present work, at the conclusion of the section on diarrhœa.—ED.

have died of an obstruction in the bowels, if they had not been taken. A captain in the Southern Whale Fishery, examined before the privy council in 1791, related, that he had found three hundred and sixty-two ounces of this substance in the intestines of a female, struck off the coast of Guinea; part of which was voided from the rectum on cutting up the bladder, and the remainder traced in the intestinal canal.—(*Phil. Trans.*, vol. lxxxi.) The mass is usually loaded with hard bony fragments, by the seamen called squids, which are the beaks of the cuttle-fish, on which the whale is known to feed.

When recently taken, the smell of ambergris is very strong, and rather fetid, but by keeping the offensiveness goes off, and it acquires a faint musky odour. It has scarcely any taste. Its colour is ash-gray, or brown, somewhat mottled: its hardness is sufficient to render it easily friable, but not to bear a polish; when broken down it has a soapy feel like steatite.

Sir Everard Home has endeavoured to account for the production of all these varieties of scybala, and to show that, while it is the office of the stomach and intestines to furnish nutriment for the muscles and membranes out of the finest part of the food, which is separated from the rest for this purpose, it is in like manner the office of the larger intestines, and especially of the colon, to convert a considerable part of the refuse matter into fat, by combining it with the bile, and to send it, thus changed in its nature, by channels of which we know nothing, into the circulation, and deposite it in almost every part of the body, to lubricate the whole, and especially to promote the growth of the animal frame in youth.—(*Phil. Trans.*, 1813, art. xxi.)

It is unquestionable that, with all our advances in the knowledge of physiology, we are, to this hour, in great ignorance of the means by which the fat of the different parts of the body is produced, or the quarters from which it is drawn. But it militates against the hypothesis before us, that we have no instance of the existence of fat in the larger intestines when they are in a state of health; and that to produce scybala of every kind, and particularly those that are more oleaginous, a weak and diseased condition of the intestinal canal appears to be indispensable. While in the second case related by Dr. Babington, in which the fatty material seems to have been elaborated in its most perfect state, the bile does not appear to have been at all transformed from its natural to any new character, nor indeed to have been in any degree operated upon; for we are expressly told, that the material when voided had "an unusually yellow tinge," notwithstanding that it was "quite fluid like oil."

The subject, however, is worth pursuing: and Sir Everard has endeavoured to support his views by a later article inserted in the same work, on the transmutation of the tadpole into a frog (*Phil. Trans.*, 1816, p. 301), in which, after showing that the intestines of the tadpole are much larger and more complicated than those it possesses in its frog state, he argues that this more extensive and elaborate machinery is for the purpose of forming a larger abundance of oleaginous matter as food, at a period when the animal is less capable of obtaining food from without; and he observes further, that the intestinal canal of the tadpole is surmounted with, and, in some species, imbedded in fat.

GENUS XI.

HELMINTHIA.

INVERMINATION. WORMS.

WORMS OR LARVÆ OF INSECTS, INHABITING THE STOMACH OR INTESTINES.

THE subject of our last genus, I observed, was new, or nearly so, to the science of pathology: that of the present is equally new to nosological arrangement; for, it is a singular fact, that while almost all systems contain a distinct genus under the name of phthiriasis, or malis, or cocyta, and some of them two distinct genera, for the purpose of arranging such insects, larvæ, or vermicles as are occasionally found infesting the surface of the body, and which, to avail ourselves of a significant term derived from old English botany, may be called animal *dodders*, few or none of them comprise any division whatever for intestinal larvæ or worms, notwithstanding the infinitely greater mischief they often produce, and the far greater difficulty of getting rid of them.*

Dr. Cullen, indeed, in the latter part of his life, was sensible of the importance of this omission, and would most probably have corrected it in his own system, had he found leisure or inclination for a revisal of it, since he has introduced the term VERMES into his "*Catalogus Morborum*, a nobis omissorum, quos omisisse fortassis non oportebat."

In many instances, however, physiologists and pathologists have abundantly supplied the deficiency; for there is scarcely a disease of any

* Every kind of animal has its *entozoa*, or internal parasites, which are peculiar to itself, just as it has its *ectozoa*, or external ones. The number of species of *entozoa* is therefore considerable, and their study constitutes an important branch of zoology. Cruveilhier thinks it more practically useful to divide the entozoa of the human race, as Linnæus did, according to the situations which they occupy: first, into such as are developed in cavities communicating with the external air (intestinal worms); and into others, which lie imbedded in the very substance of organs (visceral worms). This division seems to Cruveilhier more advantageous to the physician than that of Rudolphi, who very scientifically distinguishes entozoa, by the varieties of their form, into *nematoides*, *acanthocephala* (found chiefly in the intestines of swine), *trematoda*, *cestoides*, *taniæ*, or tape-worms, and *cystica*, or hydatids.—(Entozoorum sive Vermium intestinalium Historia. Amstel., 3 vols., 8vo., 1808, fig., and Entozoorum Synopsis Berol., 1819, 8vo.) Cruveilhier also prefers the division adopted by Linnæus to that proposed by Cuvier, who arranges entozoa into two classes; one characterized by a digestive cavity (*entozoaires cavitaires*), and another by their *parenchymatous* structure.—ED.

kind which has not been referred by some of them to vermination as its origin. This is particularly true of the school of Linnæus, though it is not confined to that seminary. Thus, Linnæus himself laboured hard to prove, that dysentery is the effect of a peculiar larva or grub belonging to the acarus or tick genus, which he has ventured to introduce into his Natural History under the name of *acarus dysenteriæ*. So Kircher has ascribed the plague to another kind of animalcule; Langius, the measles; various authors, the itch; Siggler, petechiæ; Lusitanus and Poncellus, smallpox; Dessault, lyssa, or canine madness; Hauptman, syphilis; Martin and Udman, both pupils of Linnæus, elephantiasis; and Nyander, another pupil of the same great teacher, contagious diseases of most, if not of all kinds. Some, again, have ascribed piles to the same source; others, the inspissated and vermiform mucus squeezed out occasionally from the excretory ducts of the small mucous glands of the forehead, in the present system described under the genus and species *ionthus varus*; and others again, the toothache: which last opinion seems at one time to have been adopted generally; for we find Shakspeare making one of his best-drawn characters exclaim—

"What! sigh for the toothache!
Which is but a humour or *a worm*."

It is not very wonderful, therefore, to behold the extensive use to which the *tænia hydatis*, or hydatid, is applied in modern times, so as to be regarded as the parent of almost every limpid cyst discoverable in the body; nor that cancer of the breast should be ascribed to a similar generation; and the less so, since it is not a century ago, that it was gravely argued by the most enlightened physiologists of the day, and supposed to be ocularly and irrefragably demonstrated, that man himself is, in every instance, the progeny of a similar kind of maggot, which, it was said, might be seen by any one who would take the pains to look for it, vivaciously frolicking in the vast ocean of a drop of male semen.

We are, at length, approaching to more sobriety in our observations and inquiries; and it is high time such a period should arrive; for we were in great danger of running into the wildest fancies of equivocal generation, and of equally relinquishing all principles and all limits in natural history. We now know, that an incipient stage of putrefaction, or a very short quiescence and exposure of animal fluids to a warm atmosphere, is sufficient to load them with animalcules of some kind or other; not, indeed, by fortuitously converting the constituent and decomposing principles of such fluids into the simple forms of microscopic life (for of this we have no proof whatever), but rather by affording to some few of the myriads of invisible ovula with which the atmosphere swarms, and which it may convey to them, the proper nidus, or the quickening stimulus they stand in need of. [The hypothesis of worms being the product of putrefaction only proves, that the believers in it had never examined the generative organs of those animals.—(*Merat, in Dict. des Sc. Méd.*, tom. lvii., p. 215.)]

That the atmosphere is freighted with myriads of insect-eggs that elude our senses, and that such eggs, when they meet with a proper bed, are hatched in a few hours into a perfect form, is clear to any one who has attended to the rapid and wonderful effects of what, in common language, is called a blight upon plantations and gardens. I have seen, as probably many who may read this work have also, a hop-ground completely overrun and desolated by the *aphis humuli*, or hop green-louse, within twelve hours after a honey-dew (which is a peculiar haze or mist loaded with a poisonous miasm) has slowly swept through the plantation, and stimulated the leaves of the hop to the morbid secretion of a saccharine and viscid juice, which, while it destroys the young shoots by exhaustion, renders them a favourite resort for this insect, and a cherishing nidus for the myriads of little dots that are its eggs. The latter are hatched within eight-and-forty hours after their deposite, and succeeded by hosts of other eggs of the same kind; or, if the blight take place in an early part of the autumn, by hosts of the young insects produced viviparously; for, in different seasons of the year, the aphis breeds both ways.

Now it is highly probable, that there are minute eggs, or ovula, of innumerable kinds of animalcules floating by myriads of myriads through the atmosphere, so diminutive as to bear no larger proportion to the eggs of the aphis than these bear to those of the wren, or the hedge-sparrow; protected at the same time from destruction by the filmy integument that surrounds them, till they can meet with a proper nest for their reception, and a proper stimulating power to quicken them into life; and which, with respect to many of them, are only found obvious to the senses in different descriptions of animal fluids. The same fact occurs in the mineral kingdom; stagnant water, though purified by distillation, and confined in a marble basin, will in a short time become loaded on its surface or about its sides with various species of confervas; while the interior will be peopled with microscopic animalcules. So, while damp cellars are covered with boletuses, agarics, and other funguses, the driest brick walls are often lined with lichens and mosses. We see nothing of the animal and vegetable eggs or seeds by which all this is effected; but we know that they exist in the atmosphere, and that this is the medium of their circulation. How far the tales may be true, of living animals found in abscesses in different parts of the body, and especially in scirrhous and pustulous exanthems, this is not the place to inquire; but, conceding the fact, we can only account for it by supposing their respective ovula to have been admitted into the system with the air or food we take in; and to have been separated as soon as they acquired possession of a proper nursery.

We have strong reason to believe, however, that many of the eggs or animalcules that are traced in animal fluids, occasionally find other receptacles out of the body that answer their purpose as well, and seem to keep up their respective species; and consequently, that provide

a stock of eggs, larvæ, or insects, prepared to take possession of any decomposing animal substance as soon as it is ready for their reception. And we are hence able to account for the presence of animalcules in such situations, without being driven to the necessity of supposing them to have been generated therein; and see how it is possible that they should continue to exist in a regular chain of succession, instead of being produced anomalously and equivocally by the *bildungstrieb* (as the German physiologists call it), or formative effort of a living principle, in substances in which life has confessedly ceased to exist.

Thus Rolander, who, like Linnæus, ascribed dysentery to the dysentery-tick, or *acarus dysenteriæ*, and who himself laboured under this disease while residing in Linnæus's house, contended that he had discovered the same insect in a water-vessel made of juniper-wood; and conceived that it was conveyed in great numbers into his body by the water which he drank from the cistern. So Lister affirms, that he has seen the *ascaris vermicularis* (the maw or thread-worm), which is usually found burrowing in the lower part of the intestines, infesting the surface as well. In like manner Palmærus has rendered it at least probable, that the young or ova of the *fasciola hepatica*, or fluke, found so abundantly in the liver of sheep that die of the rot, and the origin of which has so much puzzled the naturalists, are swallowed by the sheep in marsh or stagnant waters. And Linnæus himself pointed out, that the *tænia solium*, or tape-worm, the cause of whose existence in the alvine channel has been a source of equal difficulty to the physiological inquirer, exists, though much smaller, in muddy springs; and notwithstanding that Pallas at first expressed doubts upon this point, the assertion has been since confirmed by additional and satisfactory observations.*

[The *ascaris vermicularis*, which is usually considered peculiar to the human body, is alleged by Dr. Barry, of Cork, to be derived from without; as worms, differing from it merely in colour, were traced by him, in one instance, to the well of a particular country-house, two miles from Cork, where the whole family, and every other person that drank the water, invariably became afflicted with ascarides.† One argument, with which all statements of this kind are generally met, is, that intestinal worms cannot live out of the body, and therefore they must differ from worms, more or less resembling them, found elsewhere: yet, it is possible to conceive, that an animal that is hatched and attains its growth in a particular temperature, unexposed to the air, may not be able to sustain the sudden removal from its warm sheltered nursery, though it might have thriven in a much colder and more exposed situation, had it never been made too tender by the influence of habit, &c. Worms of the human intestines die, not only soon after their discharge from the body, but frequently even before they are voided, when the health of the individual is much disordered by fevers. They also invariably perish with the patient; when the supply of their wonted nutriment may be supposed to cease, and the temperature to which they are accustomed is rapidly lessened.

Some writers state that worms never meddle with the alimentary matter in the bowels, but derive their nutriment by suction from the substance, or vessels of the viscera; while others represent those worms which occupy the small intestines, as feeding on the chyle itself. The editor is not aware that any decisive evidence, exclusively supporting either of these opinions, is on record.]

Is it not surprising, that doubts should at times exist in the mind of the precise and cautious inquirer in many cases of this kind, which can only be removed by a long and attentive investigation of the history of the minute animals which give rise to them? for, first, the very same species assumes so different an appearance in different stages of its existence, that nothing but the most patient prosecution of the same individual through all his metamorphoses, could induce us to put any faith in its individuality. For who, for example, if he did not know it by the repeated experience of himself or of others, could believe that the black and the white carrion vulture of America (*vulture aura*, Linn.), which, when teased, emits a cry like a mouse, are the same bird, merely changing from white to black as it grows old? Who could divine that the tadpole, possessing gills and a fish-tail, and without legs, should be the same animal, only younger, as the four-legged frog that has neither tail nor gills? or that a like identity should apply to the caterpillar, the aurelia, and the winged moth? But, secondly, we often see an almost equal change produced in a few generations of the same species, and occasionally in the same individual, by a change of food or habitation, or both. How widely different is the domestic sheep from the argali; or the ox from the bison? yet these are the stocks from which they have proceeded. A difference of food alone produces a growth and development of sexual organs

* This statement disagrees with the observations of Bremser, Rudolphi, and Cruveilhier.—Ed.

† Barry on the Origin of Intestinal Worms; see Trans. of the Association of Physicians, &c.—Ireland, vol. ii., p. 389. It was the opinion of Linnæus, that intestinal worms were merely terrestrial or aquatic ones, swallowed either completely formed, or in the state of ova, or germes. But, against this doctrine, it is argued, that, if it had a good foundation, worms precisely similar to those met with in the human alimentary canal, would also be found out of it; as indeed Linnæus and others maintain is actually the case. But if, as Bremser has done, who devoted twelve years of his life to the study of entozoa, we strictly inquire into the facts brought forward, we shall find them to be vague, carelessly observed, and generally adduced by persons unacquainted with helminthology. Hence, Cruveilhier lays it down as an axiom, that *worms, like intestinal worms, have never been met with out of the bodies of man and other animals*, unless *discharged from them*. And another proposition which he considers completely established, is, that *no terrestrial or aquatic worms have ever been met with alive, in the bodies of men and other animals, unless they had been very recently introduced into them*.—Ed.

in the honey-bee, and converts what have hitherto been called neuters (but which are really imperfect females) into queens, or bearing bees. In many instances we can trace changes as considerable (and shall presently have occasion to remark them) in worms, or the larvæ of insects, introduced accidentally into the human intestines from without. Several of these, however, are animals with the whole of whose history we are acquainted; but we are not acquainted with the whole of the history of the ascarides, the taeniæ, and various other intestinal worms; and hence might not know them out of the body, even though we should actually meet with them under some form or other.*

As animalcules are parasitic to plants, so are plants at times parasitic to animals. As I have seen, fungi spring up night after night on the sheets of patients with gangrenous limbs, where the corrupt discharge has soaked into the sheets, and rendered them a quickening nidus. Several species of clavaria grow on the chrysalis of one or two species of cicada, and even on the perfect insect itself, as others do on the May-fly.* Were this indeed the proper place for pursuing so interesting a study, I could show not only that there is scarcely an animal of any class or order, from the highest to the lowest, but is a prey to other animals of a minuter form that infest its interior as well as its surface, but that there is scarcely a vegetable which has not also its parasitic plunderers, and is infested in like manner. But the subject would carry us too far: yet a few additional hints in relation to it are given in the comment to the Nosological System, and those who are desirous of extending the study may turn to them at their leisure.

[Worms are said to prevail in the greatest degree among the poor, dirty, ill-fed classes of society, and particularly in persons who reside in damp, marshy countries. According to M. Fortassin, the tænia is very frequently met with in butchers and others who deal in new-killed animal substances. Persons in the habit of taking a good deal of wine, and other spirituous liquors, are rarely afflicted with worms. Infants also, while they take no other food but their mother's milk, seldom have them. These circumstances, having a close reference to the causes of worms, a subject that is yet very obscure, seem well-deserving of the reader's attention; but stand in need of further confirmation.]

The various kinds of worms traced in the human stomach and intestines, have been differently arranged by different writers: but they have been chiefly assorted into *round* and *flat* worms; or into *indigenous* and *exotic*: in other words, into those which we are told are *generated* in the alvine channel, and those which enter it *from without*. The first method is too limited; and the second, as we have already seen, not only hypothetical, but built on a false basis; for we have reason to believe that every species found in this channel, primarily existed out of it.† In unfolding, therefore, the subject

* These remarks, however ingenious, are not in agreement with what is now taught by some of the best pathologists. It has often been suspected (and Boerhaave himself entertained the opinion) that when aquatic or terrestrial worms pass into the alimentary canal, the new medium in which they live, and their entirely novel condition, may account for their metamorphoses, not more extraordinary than those of the tadpole and insects. In refutation of this notion, while Cruveilhier admits the influence of external circumstances on every thing that has life, he joins M. Edwards in declaring such influence to be subordinate to the omnipotent action of race and species. The view which he takes of this subject, is supported by various considerations:—

1. The *structure* of intestinal worms has not the most distant resemblance to that of worms which live in the earth or water. 2. Why are not the same kinds of worms met with in all the species of animals, and why, on the contrary, has each species intestinal worms which are peculiar to it? 3. Why, in the same animal, does the same kind of worm constantly dwell in one particular part of its alimentary canal? 4. How does it happen, that the intestinal worm perishes almost as soon as it is voided from the alimentary canal, just as the terrestrial or aquatic worm dies immediately it has entered the digestive tube? 5. How, in the hypothesis professed by Boerhaave, and to which our author inclines, would it be possible to account for the almost interminable reproduction of intestinal worms, if the animal's body within which they multiplied were not the medium they were destined for? But in the same manner as certain larvæ of insects, introduced into the alimentary canal of certain animals, find here alone the only requisites for their development, why should not human intestinal worms proceed from the introduction of particular germes into the alimentary canal, which in any other situation could not thrive? This question suggested itself to Cruveilhier by a case, in which a very large caterpillar was alleged to have been voided with the feces, and on which occurrence both Cruveilhier and M. Jules Cloquet were consulted. The latter communicated his opinion of the circumstance in a note:—"The animal shown me is the caterpillar of a moth, perfectly developed, and ready to be transformed into a chrysalis. If it has been discharged *alive* by vomiting, it must have been swallowed by the patient immediately before its ejection. If really swallowed, its magnitude prevents us from supposing that this could have happened inadvertently; nor could this have taken place when the larva was but of trivial size, because its *organization would have formed an impediment to its living and growing in the intestinal canal.*"—(See Dict. de Méd. et de Chir. Pratiques, art. ENTOZOAIRES.) Cruveilhier considers this the most rational explanation which the case admits of, and the only circumstance that rather shakes his confidence in it, is what happens in the horse with respect to the ova of the œstrus or common gadfly; a subject hereafter touched upon. Dr. Elliotson once saw two centipedes, said to have been vomited by a girl twelve years of age; the animals had lived three days when he saw them. If they were truly swallowed, and lived any considerable time in the stomach, the fact is curious; because these insects one would not expect to be capable of living long in the fluids of the stomach.—ED.

* Mémoires sur des Insectes sur lesquelles on trouve des plantes, par M. Fougeroux de Bouderoy.—Vide Hist. de l'Académie Royale des Sciences, an 1769.

† Some of the facts and arguments brought forward by Bremser (Traité Zoologique et Physiologique sur les Vers Intestinaux de l'homme, avec

further, we shall employ a different arrangement, and comprehend, under the genus HELMINTHIA, three species of diseases, equally distinguished from each other by symptoms, and by the different tribes of animals which give rise to them; viz. those which are nourished and find a proper habitation throughout every part of the alvine canal; those whose proper habitation is limited to the extremity of the canal; and those which have no proper habitation in any part of it, and enter it erroneously or by accident.

1. Helminthia Alvi.	Alvine Worms.
2. ——— Podicis.	Anal Worms.
3. ——— Erratica.	Erratic Worms.

SPECIES I.

HELMINTHIA ALVI.

ALVINE WORMS.

WORMS EXISTING AND FINDING A PROPER NIDUS IN THE STOMACH OR ALVINE CANAL, CHIEFLY OF CHILDREN AND SICKLY ADULTS; PRODUCING EMACIATION, A SWELLED HARD BELLY, GNAWING OR PUNGENT PAIN IN THE STOMACH, PALE COUNTENANCE, FETID BREATH, AND IRRITATION OF THE NOSTRILS.

THE worms that chiefly infest this region, and produce these symptoms, may be arranged under the following varieties:—

α Ascaris lumbricoides.	Long round-worm.
β Trichocephalus.	Long thread-worm.
γ Tænia solium.	Long tape-worm.
δ Tænia vulgaris.	Broad tape-warm.
ε Fasciola.	Fluke.

[So common are certain worms in the human subject, that it is calculated one half of the total number of children have either the round or thread-worm. Tænia is more rare, however; so that an estimate has been made, that in France, only one individual in a hundred suffers from it.—(*Dict. des Sciences Méd.*, tom. lvii., p. 215.) Worms are often only of one kind, and most frequently of the long round species; yet it is not very uncommon to find two species existing together in the alimentary canal. The records of medicine furnish examples of patients who even voided simultaneously ascarides, tæniæ, and lumbricoides. Generally speaking, the smaller the worms, the more numerous they are; and the tænia, the largest, has received the epithet of *solium*, from the supposition that it is always solitary, which was the notion of Hippocrates; but this is a mistake, for in the human subject several may be met with together; and in animals, and especially in the canine race, tape-worms sometimes exist together in great numbers. It was Bremser's belief that an entire tape-worm had never been seen, as the caudal articulations, which are loaded with fecundated ova, break off, and are discharged, before the complete development of the joints towards the head.]

The head of the LONG ROUND-WORM is slightly incurved, with a transverse contraction beneath it; mouth triangular; body transparent, light yellow, with a faint line down the sides; gregarious and vivacious; from twelve to fifteen inches long: inhabits principally the small intestines of thin persons, generally about the ileum, but sometimes ascends into the stomach, and creeps out of the mouth and nostrils; occasionally travels to the rectum, and passes away at the anus. Frank notices an instance of eighty of these worms rolled up into a ball, and expelled during a fever; and gives another case, in which the whole intestinal canal, from the duodenum to the rectum, was crammed with them.—(*De Cur. Morb. Hom. Epit.*, tom. vi., lib. 6.)

[They sometimes quit the alimentary canal and lodge in some adjacent part. MM. Andral and Blandin met with one example, in which a long round-worm had insinuated itself into the cavity of the larynx, and lay between the two chordæ vocales. The patient, a child, had been suddenly seized with extreme difficulty of breathing, and very shortly died of suffocation. M. Andral was shown, by M. Guersent, a liver that had been, as it were, pervaded in different directions by long round-worms, which had passed from the duodenum into the liver, through the ductus choledochus. Andral was acquainted with only one additional fact of this kind; it is recorded in the Bulletins de la Faculté de Méd. de Paris.

Long round-worms, in a few rare cases, pass through a perforation in the bowels, get into the peritoneum, and either remain there, or are discharged through a cutaneous fistula, or insinuate themselves into the bladder or vagina.

With regard to the questions whether these worms can only pass from the intestines into another organ, through an accidental opening already existing? or whether they sometimes form the passage themselves? M. Andral is of opinion, that if the latter case ever takes place, it must be extremely rare. As the ascaris lumbricoides cannot live out of the alimentary canal, it is fair to presume that even if it had the power of perforating the coats of the intestine, and getting out of it, the instinct of self-preservation would hinder it from doing so. Yet the same author conceives that this may not be the case after the death of the animal in which an ascaris lumbricoides is developed, and that the latter may then have a greater inclination than during life to make its way through the parietes of the bowels.* The disturbance of the constitution by a severe attack of fever seems to extend its effects to these inhabitants of the digestive canal, as the frequency of their evacuation during such illness is well known.†]

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des notes de Blainville, Paris, 1824, 8vo.) and by Cruveilhier, against the side of the question taken by Dr. Good, have been adverted to in the preceding notes.—Ed.

* Précis d'Anat. Pathol., t. ii., p. 181. Cruveilhier joins Rudolphi and Bremser in rejecting the opinion that intestinal worms ever form the perforation themselves, and believes that when they pass through the coats of the bowels, it is in consequence of an aperture having been first produced by ulceration.—See Dict. de Méd. et de Chir. Pratiques, art ENTOZOAIRES.

† Dr. Gaspard mentions an epidemic remittent

This animal will sometimes remain so quiet in its proper region, as to give no signs of its existence but by its discharge. Frequently, however, it is a troublesome and mischievous intruder, producing an intolerable feeling of faintness, great emaciation, and most of the symptoms enumerated under the specific definition. In its general appearance it bears so striking a resemblance to the earth-worm (*lumbricus terrestris*, Linn.), that by many naturalists it has been regarded as the same. Yet, to an attentive observer, there is a considerable difference both in their form and movements.* The body of the intestinal worm is round, its colour is a pale red, its head is furnished with three vesicles placed triangularly, and, in moving, it curls its body into circles, from which it extends its head. The earth-worm is flat towards the tail, and has bristles on its under side, which it can erect at pleasure. Its colour is dusky red; its head has but one vesicle, and it moves by a continuous course of action propagated from ring to ring.

[Morbid anatomy throws no light on the causes of the formation of the ascaris lumbricoides, which occurs in every possible organic condition of the bowels: they may be red or pale, dry, or full of mucous secretions. Around the places in which many worms collect, the intestine is frequently red, while the group of worms itself is often enveloped in a mass of mucus (*Andral*, vol. cit., p. 183); but these appearances are to be entirely referred to the worms' acting as foreign bodies, and have nothing to do with their production.]

The body of the LONG THREAD-WORM is elastic and contorted, the hinder part thick, the anterior capillary twice as long as the thick part, and terminating in so fine a point, that the mouth is scarcely discernible; its upper surface subcrenated; its lower smooth; it sucks with its small capillary extremity; is from an inch and a half to two inches in length; finely striate on the fore part: in colour resembles the preceding; gregarious, and found chiefly in the intestines of sickly children; generally in the cœcum. Roederer and Wagler found a large quantity of trichocephali in the colon. They are found also in many animals besides man, as the horse, boar, fox, and mouse. The male may be distinguished by the curved shape of its posterior extremity. In its slender body a straight alimentary cavity is seen, with spermatic vessels, or oviducts, around it.

In the LONG TAPE-WORM the articulations are long and narrow, with marginal pores by which it attaches itself to the intestines, one on each joint, generally alternate; ovaries aborescent; head with a terminal mouth surrounded by two rows of radiate hooks or holders; and a little below, on the flattened surface, four tuberculate orifices or suckers, two on each side; tail terminated by a semicircular joint without any aperture; from thirty to forty feet long, and has been found sixty. Inhabits the intestines of mankind, generally at the upper part, where it feeds on the chyle and juices already animalized. It has also been found in the stomach;* is sometimes solitary, but occasionally in considerable numbers; and adheres so firmly to the intestines, that it is removed with great difficulty. [It is seldom met with in France, where the broad tape-worm prevails; but it is common in Italy and Saxony.—(*Merat, in Dict. des Sc. Méd.*, tom. lxvii., p. 227.) While the ascaris lumbricoides, the trichocephalus, and ascaris vermicularis, are most common in children, the tænia is chiefly noticed in adults.] The animal is oviparous, and discharges its numerous eggs from the apertures on the joints. Werner asserts that it is hermaphrodite. The broken-off joints have, when discharged, the appearance of gourd-seeds: and it is hence denominated gourd-worm by many medical writers; and is the *lumbricus cucurbitinus* of Dr. Heberden. Dr. Sibbarngaard gives the case of an adult female patient, who was infested with a tape-worm of enormous length, meas-

and intermittent fever that occurred in France in 1826, with peculiar severity. The discharge of living intestinal worms, with copious quantities of bile, was a common occurrence in it. In one case, true caterpillars were also voided, both from the stomach and rectum.—Magendie, Journ. de Physiol., tom. ix., p. 230.

* See Baillie's Morbid Anatomy, Hooper on Intestinal Worms, Mem. Lond. Med. Soc., vol. v.; and Bremser's Treatise, already referred to.

* Since this sheet was sent to press, the editor, through the kindness of Mr. Docker, formerly an eminent surgeon at Canterbury, has been informed of an extraordinary case, now under the care of Mr. Law of Penrith, Cumberland, in which the bladder is the seat of tænia. The patient is a young woman, about twenty years of age, and first felt a sensation, like a rupture of the bladder, when in the act of stooping to cut corn, in August, 1829. After this, she began occasionally to have discharges of bloody urine, with the sensation of something moving in the bladder, more particularly after each evacuation. In October, 1830, some consideration of the symptoms led Mr. Law to try turpentine both by the mouth and in injections. Great irritation ensued, but eight joints of a tænia were discharged from the meatus urinarius *alive*. Opiate injections were then tried, which, having been persevered in for three days, seemed to put an end to all motion of the worm; and by an expansion of the meatus, its discharge was effected in large quantities; but in so decayed and broken a state, that its parts could not be numbered; but Mr. Law is certain that there could not be less than two thousand joints. With these there was much hemorrhage, and discharge of membranous and other substances, like pieces of liver. A period of tranquillity now followed, and lasted until January, 1831, when she began to suffer again, and voided, with the aid of turpentine, in the course of eight or nine months, one thousand two hundred and thirty-nine joints; and, subsequently, an immense number of others. Mr. Law has in his possession one portion, consisting of twenty-nine joints. As this case will, no doubt, be published before the completion of this edition, the editor will merely add, that he has examined some of the portions of tænia voided, and that no doubt can be entertained of the facts above specified. Drs. Elliotson and Carswell have also examined the specimens, with the reality of which they are entirely satisfied.—ED.

aring not less than thirty-eight yards, or one hundred and fourteen feet. It was expelled from the anus, after three doses of a bolus, consisting of two drachms of tin filings and half a drachm of jalap mixed up with honey, had been taken.*

The articulations of the BROAD TAPE-WORM (bothriocephalus) are short and broad, with a pore in the centre of each joint, and stellate ovaries round them; body broader in the middle, and tapering towards both ends; head resembling the last, but elongated, marked with two lateral depressions, and not provided with a neck; tail ending in a rounded joint. [The anterior joints are like plaits, but the posterior ones are very distinct. The apertures, which in the long tape-worm are situated at the edges of the articulated parts, here lie in their centre. These peculiarities in the bothriocephalus, certainly justified Bremser in setting it down as a particular genus. But, as an additional reason for doing so, it may be observed, that it infests almost exclusively the Russians, Poles, Swiss, and the natives of certain parts of France; while the long tape-worm resides in the small intestines of other Europeans and the Egyptians.†] Like the last, it inhabits the upper part of the intestines, and feeds upon chyle; generally from three to fifteen or twenty feet long; usually in families of three or four. [Rudolphi had a specimen, the rings of which were an inch in breadth. Boerhaave assures us that he succeeded in discharging a worm of this kind from a Russian, that measured three hundred ells!]

The body of the FLUKE is flattish, with an aperture or pore at the head, and generally another beneath; intestines flexuous; ovaries lateral: hermaphrodite, and oviparous.‡

Of all intestinal worms, this is one of the most common to animals of different classes. It is sometimes, though rarely, found in man (*Doever, Verm.*, p. 54; *Clerk, Lumbric.*, p. 119); but in different species, or under different modifications, we meet with it very frequently and very abundantly in quadrupeds of almost all kinds, reptiles, fishes, and even in worms themselves of a larger growth, for it is occasionally met with in the intestines of the cuttle-fish. Its ordinary seat is in the stomach or alvine channel; but in swine, black cattle, deer, and sheep, its favourite haunt is the liver, to which it probably creeps forward through the bile-ducts, and where it burrows and breeds in innumerable hosts. This is particularly the case with the *fasciola hepatica*, as it is called by way of emphasis, found so commonly and so abundantly in the liver of sheep that labour under the disease called the rot; though whether it be the cause or the effect of this disease, has not yet been ascertained. Most probably the effect: for the rot is certainly an infectious complaint, and is sometimes caught by a whole flock in a single night. The cause has been supposed to be hydrogenous gas; but of this we have no proof. There can be little doubt, however, that it is produced by some deleterious miasm in the atmosphere originating in the pasture itself, or conveyed there in the form of a haze, in the same manner as vegetable plantations are often blighted, of which I have just offered an example from hop-grounds. Yet by what means the liver of sheep, rather than any other organ, is hereby affected and rendered gangrenous, we have still to inform ourselves. As the animal is oviparous, the minute eggs may be borne by the haze itself, or exist in the stagnant atmosphere of the sheep-ground; or they may already, in the body of the parent-worm, be infesting the alimentary canal, and only waiting for accidental circumstances to exert the full range of their prolific powers; for it is not in the rot alone, but in other cases of visceral diseases, that this animal is traced in sheep, and especially in dropsy, whether connected with the rot or not; and, in both diseases, they are frequently found vomited up in brooks.

As the treatment of all the species should be established on the same principle,—that of invigorating* the alimentary canal and surrounding viscera,—and the vermifuges adapted to many of the different tribes, though not to all, are the same,—it will be better to reserve this subject till the nosological characters of the remaining species have passed in review before us.

SPECIES II.

HELMINTHIA PODICIS.

ANAL WORMS.

WORMS, OR THE LARVÆ OF INSECTS, EXISTING AND FINDING A PROPER NIDUS WITHIN THE VERGE OF THE ANUS, EXCITING A TROUBLESOME LOCAL IRRITATION, SOMETIMES ACCOM-

* Societatis Medicæ Havniensis Collect., vol. ii., 8vo. Van Doeveren mentions an instance in which a portion of tænia was voided, 150 feet long; and Rosenstein records a case in which a tænia 300 feet in length was discharged from the bowels. Cruveilhier suspects, that some of these calculations have been made either by adding together the lengths of pieces of different worms, or taking the aggregate lengths of portions of one worm discharged at different periods. The longest in Bremser's possession was twenty-four feet, who however quotes an instance where a tænia was found in the dead subject, reaching from the pylorus to within a few inches of the anus, and measuring thirty feet.—Ed.

† Cruveilhier, art. ENTOZOAIRES in Dict. de Méd. et de Chir. Pratiques.

‡ C. A. Rudolphi's works, entitled, Entozoorum sive Vermium Intestinalium Historia Naturalis, Amst., 1808, and Entozoorum Synopsis, Berol., 1819, should be consulted by all who desire the most correct description of intestinal worms. Nor should the writings of Bloch, Goeze, Zeder, Werner, Hermann, Fischer, Brera, Hooper, Lamarck, Dumeril, Cuvier, Blumenbach, Bremser, Laennec, and Cruveilhier (Dict. de Méd. et de Chir. Pratiques, art. Entozoaires) be forgotten.—Ed.

* This expression seems to be connected with an hypothesis entertained by some writers, and adopted by Dr. Good, that the production of worms is referrable to a debilitated state of the alimentary canal.—Ed.

PANIED WITH TUMOUR; FREQUENTLY PREVENTING SLEEP, AND PRODUCING PAIN OR FAINTNESS IN THE STOMACH.

UNDER this species are included the following varieties :—

α Ascaris	Vermicularis.	Thread-worm. Maw-worm.
β ———	Scarabæus.	Beetle-grubs.
γ ———	Œstrus.	Bots.

The head of the THREAD-WORM is subulate, nodose, and divided into three vesicles, in the middle of each of which is an aperture by which it receives nourishment; skin at the sides of the body finely crenate or wrinkled; tail finely tapering and terminating in a point; the female has a small punctiform aperture a little below the head, through which it receives nourishment; gregarious; viviparous; about half an inch long; sometimes wanders into the intestines, and occasionally as high as the stomach.* It was first observed by Morgagni.—(Lib. xiv., 42.)

The sexes of this variety are distinct, but the male organs have not been discovered. This form of intestinal worms was first detected by Hippocrates.—(*Aphor.* iii.) Goeze conceives it to be viviparous, but Bremser oviparous.—(*Ueber Lebende Würmer*, 4to., 1819.) It is the *oxyuris vermicularis* of the latter. The animals are of a yellowish white colour, and have a general resemblance to the *ends of threads* cut off, and about half an inch in length, whence the name of THREAD-WORMS, and probably of BOTS, which is often, but erroneously, applied to it, and which I suppose to be a corruption of the French *bouts*, "ends" or "extremities." The term MAW-WORM, according to Dr. Harvey, is derived from the occasional visit which this animal makes to the maw or stomach in migrating from its proper region, which is the rectum (*On Consumptions*); but, more probably, from the peculiar effects which it often produces on the maw or stomach by sympathy, and without quitting its home, as a perpetual and gnawing pain and insupportable faintness from the intolerable itching it excites in the anus. Sometimes these worms wander in a different direction, for they have been found in the pudenda: and by Frank in the urethra and the urine.—(*De Cur. Hom. Morb. Epit.*, tom. vi., lib. vi.) Very generally, however, they remain quiet and inactive, convoluted in mucus and feces, and are only known to exist by their discharge. Yet occasionally they produce so much irritation as to cause a sensible tumour, or a congeries of small tumours, around the anus. They sometimes co-exist with other kinds. Rosenstein gives the case of a child, who, in conjunction with a large number of ascarides, voided ten long worms and a piece of a tænia. The little patient died screaming under the most excruciating pain and convulsions.

The larvæ of the second variety embrace several species of the SCARABÆUS or BEETLE (*Paulini*, cent. iv., obs. 8; *Timæus*, Cas., p. 120), which have not hitherto been accurately described or enumerated; but of which the following seem to be the chief; gray larva, with yellowish legs and ferruginous head, of s. nobilis; and those of s. Schœfferi, and s. volvens, which, when out of the body, deposite their eggs in round balls of animal dung, which they roll up and bury with their hind feet. Almost all the grubs of the genus Scarabæus delight in and feed on dung; and hence the eggs find a convenient nidus and the grubs a ready supply of food in the rectum, when accident has conveyed the former into this organ. These grubs have six feet; are annulate, hairy, vesicular at the end of the abdomen, and furnished with a horny head.

The larvæ of the ŒSTRUS, BREEZE, or GADFLY, are called bots, and are of a round figure; pale-green; tail obtusely truncate; head tapering; mouth horny, with two lips, and two recurved black claws on each side of the mouth. Found convoluted in the mucus and feces of man, but far more frequently of other animals, and especially of the horse.

The genus œstrus is not numerous, containing in all not more than twelve species. Of these the greater number deposite their eggs on the skin of animals, and are there hatched. The *œstrus ovis* fixes them on the interior nostrils of the sheep; from which, when hatched, they travel into the frontal sinuses or horns, and, when full fed, are discharged through the nostrils. They excite great irritation, often compelling the sheep to shake their heads violently, and rub or hide their noses in dust or gravel, and sometimes produce inflammation in the brain.

There are only three species, however, whose larvæ seem capable of being hatched in the intestinal canal. These are *œstrus equi*, *œ. hæmorrhoidalis*, and *œ. veterinus*. The eggs of the last are found deposited on the skin of cattle in general, and those of all on the skin of the horse: the part of the horse preferred by hemorrhoidal breeze being the lips. The eggs excite a troublesome titillation, which induces the animal to bite the part and lick it with its tongue, in consequence of which the eggs are transferred from the skin to the tongue itself, and find a ready conveyance to the rectum, which is their proper nidus.*

* Bremser doubted whether ascarides vermiculares had ever been found out of the large intestines. Yet Bloch, long before the date of this author's treatise, had met with them in a cyst formed in the parietes of the stomach; and Brera had seen a considerable number of them in the œsophagus of a woman who died of a slow nervous fever.—(Traité des Maladies Verminenses trad. de l'Italien avec des Notes, Paris, 1804.) The worms which have been occasionally detected in the air-passages were the ascarides lumbricoides; but Cruveilhier conceives, that their lodgment in this situation would be incompatible with life, and that their arrival there must have happened after death, or during the final moments of life. In one of these periods, he thinks they passed through the œsophagus into the pharynx, and thence into the glottis. In the example recorded by Andral, the insinuation of such a worm into the larynx of a child produced suffocation.

* Such of the ova of the œstrus as are conveyed into the horse's stomach by deglutition become

It is the hemorrhoidal breeze whose eggs are chiefly if not solely hatched in the human intestines, and especially those of grooms and other persons, whose duty leads them to associate much with horses, and other large domesticated quadrupeds. And it is the grubs or larvæ of this genus, when discharged from the anus, that constitute the proper *Bots* of veterinary writers, though the term is often misapplied to the *ascaris vermicularis*, as observed already, to which, indeed, they have some resemblance.

Mr. Greenhaw has described a very copious discharge of transparent globular materials from the rectum of a boy of nine years of age, which he thinks were hydatids.—(*Edinb. Med. and Surg. Journ.*, No. lxxvii., p. 574). [They were of the size, and many of them of the colour of gooseberries. The editor was once consulted by a gentleman who occasionally voided from the rectum a yellowish fluid, containing small globular bodies, resembling hydatids, attended with severe irritation about the bladder.]

SPECIES III.
HELMINTHIA ERRATICA.
ERRATIC WORMS.

WORMS, OR THE LARVÆ OF INSECTS, INTRODUCED BY ACCIDENT, AND WITHOUT FINDING A PROPER HABITATION IN THE STOMACH OR INTESTINES; PRODUCING SPASMODIC COLIC, WITH SEVERE GRIPINGS; AND OCCASIONALLY VOMITING, OR DEJECTION OF BLOOD.

Of this subdivision we know but little; yet the ensuing instances may afford sufficient reason for forming it. It might easily be enlarged; but the authorities for extending it further are doubtful.

α Gordius.	Hair-worm.
β Hirudo.	Erratic leech.
γ Musca.	Maggots.

The GORDIUS is the seta equina, or horse-hair-worm, of the old writers. It is found in soft stagnant waters; from four to six inches long, twisted into various knots and contortions; colour, pale-brown, with dark extremities.

This disease is most frequent among the peasants of Lapland, and was suspected by Linnæus, and has been since proved, or thought to be proved, by Dr. Montin, one of his most celebrated disciples, to be occasioned by their drinking the half-putrid water of stagnant marshes or ditches inhabited by the gordius. It is not known on the Lapland mountains. The gripings are often so violent that the patient rolls and writhes on the ground in severer agony than a woman in labour, and discharges bloody urine. After many hours, sometimes an entire day, the disorder terminates in a profuse ptyalism, that continues for a quarter of an hour. The Laplanders call the disease *Ullen*, or *Hotme*.*

The SECOND VARIETY includes several species of the LEECH, swallowed, when minute and young, along with the muddy and stagnant water they inhabit.

Apparently both the medicinal and the horse-leech (*h. sanguisuga*) have been thus found; but the exact species has not been sufficiently indicated. Sauvages, in his genus Hæmatemesis, quotes Galen, Schenck, and Wedel, but does not describe the species. Upon turning to Galen, iv., 411, D., the reader will find that he briefly adverts to the disease, and quotes from Asclepiades and Apollonius the remedies that were employed in their respective days; but he does not characterize the worm.

Of helminthia, from this cause, we have numerous examples in foreign writers and journals;† but we need not travel from our own country for instances. Of domestic examples, several are related in the comment to the volume of Nosology; and though apparently well attested, are of a truly marvellous character. The fact appears to be, that, from fixing on the internal tunic of the stomach, or intestines, these worms riot on so rich and plentiful a repast, that they grow to an enormous size, and evince such a deviation from their common shape, as in some instances to be recognised with great difficulty. It is highly probable, however, that they can only live in dyspeptic patients, or persons whose digestive powers are infirm: for there are few or no animals capable of resisting the solvent power of the gastric juice when secreted in full health and vigour.

One of the most extraordinary instances among those entitled to attention is related by Mr. Paisley in the Edinburgh Medical Essays.—(Vol. ii., art. xxvi.) In this case there were two worms, whose heads the author compares to that of the horse-leech, and which appear to have been tolerably quiescent in their growth, till the general system was disturbed by a wound on the breast received by the patient in consequence of a duel with the small-sword. The general symptoms of this species of helminthia appeared about the third day afterward, and continued with many variations for several weeks, when the patient discharged inferiorly one of these worms, measuring a foot and a half in length, and an inch and a half in diameter, dead, but full of blood, and accompanied by a large dejection of grumous blood, "to appearance some pounds;" and not many weeks afterward the other, still larger. A worm, apparently similar, is stated by Dr. Bond of Philadelphia, in 1754, to have been discharged downwards, by a female patient of his, who had been long subject to an hepatic disease, which gradually changed to violent helminthic symptoms in the

larvæ, or grubs, which attach themselves by tenacula to the lining of the œsophagus and stomach, and seldom to the interior of the bowels. When they are completely developed, and prepared for another metamorphosis, they are spontaneously loosened, and then voided with the excrement. A horse's stomach, studded with a multitude of these larvæ, not only in its epidermic or splenic portion, where they usually fix themselves, but in its pyloric part, is what everybody must have seen.—ED.

* Linn. Flor. Lap. de Angelica. Montin, Amœn. Acad. Splachnum, ii., 26.

† Eph. Nat. Cur., cent. vii., obs. 25. Rhodius, cent. ii., obs. 72. Blanchard, Collect. Med. Phys. cent. i.

stomach. These at length suddenly vanished, and within twenty-four hours the worm was dejected, dead, and in two parts, the whole making twenty inches in length. The patient died soon after; and on opening her, this worm appears to have worked its way, when small, into the liver, by the course of the common duct, to have committed great depredation here, and afterward, with considerable difficulty and dilation of the duct, to have travelled back again. Dr. Bond ventures to call it an *hepatic leech*; though he calculates its course as now stated. —(*Lond. Med. Observ. and Inq.*, i., 68.)

[In Egypt, the French soldiers, urged by severe thirst, frequently drank the muddy water of lakes and pools; an opportunity was thus given for the insinuation of leeches into their nostrils, and even into their stomach. The same annoyance likewise befell the soldiers of the same nation at Port Mahon, in 1757. In one of the latter cases, the patient, after having vomited up three pints of blood, requested of his own accord the proper remedy, namely, some vinegar; and as soon as this had been taken, the leeches were rejected. According to Larrey, the removal of these animals from the nostrils, when they cannot be laid hold of with forceps, is most effectually accomplished by means of a lotion, composed of nitre and diluted vinegar.—(*Mem. de Chirurgie Militaire*, tom. i., p. 362.)' The long continuance of the leeches generally produced much indisposition, a loss of flesh, and sometimes delirium.]

The THIRD VARIETY consists of the grubs of different species of that subdivision of the genus MUSCA, or FLY, whose sucker is possessed of a single bristle without a sheath, and short; clavate, furnished with a lateral hair. These deposite their eggs in game and other meats that have been long kept, and are approaching a putrid state, as *musca carnaria*, or flesh-fly; *m. somitoria*, or blow-fly; *m. cibaria*, or pantry-fly; or perforate and lay their eggs in cheese, bacon, hams, or other salted and high-tasted viands, as *m. putris*, the larvæ of which are known to the housewife by the name of *hoppers*, as those of all of them are by that of *maggots*; which last has often, though in a looser sense, been applied to the grubs of insects generally.

From the deposite of the eggs of these species of the fly in so many branches of the common food of man, there is no difficulty in conceiving how they may pass into the human intestines. In a sound state of the stomach, indeed, we have little reason to believe that they could be hatched and live in that organ; but they may find a convenient nidus, and live comfortably in a debilitated stomach, and apparently through the entire range of the intestinal canal.

The cases of this affection are numerous. One of the best related is that of Dr. White. The patient, aged thirty, was emaciated, of a sallow complexion; had gripings and tenderness of the abdomen; costiveness, rigours, and cold extremities. Took columbo root, and occasionally calomel and other purgatives. In a month was better, and the appetite good. The next purgative brought away an immense number of pupes or chrysalid worms; some of which being preserved, were transformed into the *musca cibaria*.

We have also examples of the larvæ of other insects that have entered the stomach by some accident or another. Thus, Mr. Church, to whose entomological skill Dr. White confided the examination of the above paper, asserts, that he once knew a child discharge a larvæ of the caddy insect (*phryganea grandis*); and that the *phalæna pinguinalis* lives and is nourished in the stomach; and, after sustaining several metamorphoses, is thrown out, and proves its proper genus.—(*Mem. of Med. Soc. of London*, vol. ii.) Mr. Calderwood has published a like case (*Edin. Med. Com.*, ix., 223); Riedlin, examples of other fly-maggots (Cent iii., obs. 85); other writers, of the larvæ of the beetle, or the bee, discharged by the anus after violent gripings;* while Planchon describes a live spider thrown forth from the same opening.—(*Journ. de Méd.*, iv., p. 203.)

Weikard gives an instance of a *triton palustris* discharged by vomiting (*Vermischte Schriften*, iv., p. 127; *Kl. Schrift.*, p. 82); and many of the continental writers have examples of rejection by the same passage of the *lacerta aquatica*, unquestionably swallowed when minute and unperceived, with the water obtained from ponds and lakes.† In one instance not fewer than five of these were thrown back at a time.‡

But of all such marvels, the most extraordinary, and one of the best attested, is that narrated by Dr. Pickells;◊ consisting of enormous progenies of apterous, dipterous, and coleopterous insects, discharged both by the mouth and anus. The patient was a young woman, who had long been in a melancholy frame of mind from the loss of a beloved mother, and who, under a superstitious idea, that a certain portion of clay drunk daily, from the graves of pious clergymen, would preserve her from disease as well as from sin, contrived to stock her chamber with a large quantity of this material from the graves of two clergymen whom she had known, and which appears to have formed a bed for the eggs of the insects thus hatched in the stomach. "Of the larvæ of the beetle," says Dr. Pickells, "I am sure I considerably underrate when I say that, independently of above a hundred evacuated per anum, not less than seven hundred have been thrown up from the stomach at different times since the commencement of my attendance. A great proportion were destroyed from an anxiety to evade publicity; many, too, escaped immediately after having been vomited, by extricating themselves quickly from the vessel, and running into holes

* Obs. Méd. Cur. de excretione vermis nunquam ante excret. Wolffenb., 1723.

† Journ. de Médecine, tom. ix., p. 447.—Schwarz, Med. Wockenblatt., 1780. No. 27.

‡ Observ. Méd. Cur. de excretione vermis, etc., ut supra. Wolffenb., 1723.

◊ Trans. of the Association of the Fellows and Licentiates of the King and Queen's College of Physicians in Ireland. vol. iv. art. vii.. 8vo., 1824.

in the floor. Upwards of ninety were submitted to Dr. Thompson's examination, nearly all of which, including two of the specimens of *tenebrio molitor* (*darkling*), I saw myself, thrown up at different times. The average size was about an inch and a half in length, and four lines and a half in girth. The larvæ of the dipterous insect, though voided only about seven or eight times, according to her account, came up almost literally in myriads. They were alive and moving." [In an interesting appendix (Op. cit., vol. v., p. 171, &c., 8vo., 1828) to the preceding account, Dr. Pickells states, that under a persevering use of common turpentine, in doses gradually increased to the enormous one of six ounces, the larvæ of the beetle, which were the principal source of annoyance, had been destroyed, and that the patient now enjoys almost total immunity from her long-protracted and complicated diseases. In the course of a year and a half subsequent to his former communication, she had voided more than 1300 additional beetle larvæ, principally from the anus, making in the whole nearly 2000 seen by Dr. Pickells, besides many others which he did not see. Besides the beetle larvæ, dipterous ones continued to be voided at intervals during the same period, both from the stomach and the rectum; sometimes without medicine, but more frequently by the effect of castor-oil, strong doses of turpentine not killing them. Ascarides resembling the ascarides felis, were also discharged upwards and downwards, as well as numerous larvæ of blaps. Whence the constant supply of the latter was derived, is a very puzzling question in the history of this extraordinary case; for, if they propagate only in the imago, or perfect state, as is asserted, their generation within the body can hardly be supposed, as only two insects far advanced, one an imago, the other a pupa, were known to be discharged, and yet larvæ of every gradation continued to be voided to the last. Her food and drink were from the same source as those taken by other healthy persons; and she lived on an upper floor where the kind of beetles, which she voided, are not usually found.]

Many of the larvæ or insects thus thrown up had been preserved alive in clay or pill-boxes, for upwards of a twelvemonth, at the time of writing. Pain in the stomach, suppression of the menses, irritation of the bladder, hæmatemesis, occasional perversion of all the external senses, vertigo, convulsions, catalepsy, mania, delirium, and various other affections of the nervous system, indicative of helminthic irritation, were the sad train of evils that alternately overpowered the patient. [The quantity of blood thrown up from the stomach in the course of the case, was such as to create surprise that she should have been able to bear the loss. A retention of urine, with which she was long afflicted, was completely removed after a dose of five ounces of turpentine, a great deal of blood at first coming away with the urine. The same medicine also evinced great power in restoring the catamenia.]

To all these parasitic vermicles will apply the remark I have already made upon a single variety; that they appear, from the luxuriance of their haunts and repasts, to be in various instances peculiarly enlarged, and altered from the structure they exhibit out of the body (*Bremser*); whence the great difficulty of determining in many cases the exact external species to which a larva, worm, or animalcula found within the animal body may belong. Yet of all the erratic worms and grubs, the horse-leech, hirudo *sanguisuga*, appears to undergo the greatest metamorphosis; and, as observed in the comment to the Nosology, is reported to have reached the size of a man's fist, and to have contained a pound and a half of blood.

General Diagnosis and Treatment.

We have had occasion to observe that the stomach is the great organ of sympathy, and associates in affections of the most remote parts of the system. It follows necessarily, that other parts of the system must, in various instances, associate in affections of the stomach. This is particularly the case with respect to the irritation produced by worms, and especially those that exist in the stomach itself, or the upper part of the alvine canal, as lying nearest to it.

"The evils which hence arise," says Dr. Heberden (Cap. lix., p. 243), who has well drawn up the general train of symptoms, "and which cease on their expulsion, are headaches, vertigo, torpor, disturbed dreams, sleep broken off by fright, and screaming, convulsions, feverishness, thirst, pallid hue, bad taste in the mouth, offensive breath, cough, difficult breathing, itching of the nostrils, pains in the stomach, nausea, squeamishness, voracity, leanness, tenesmus, itching at the anus towards night, at length dejection of films and mucus. The broad tape-worms produce the severest mischiefs on the body; the teretes and ascarides (round and thread-worms) sometimes lurk scarcely suspected unless there is itching of the anus, or they are traced in the feces. I have seen a broad tape-worm expelled from the intestines four ells in length. The long tape-worm (*lumbricus cucurbitinus*) seems to be a series of many worms, a single joint of which will sometimes live when separated from the rest. The round-worms have ascended into the mouth, and have even lived two or three days after they have been discharged. In two patients under my care, there was room for suspecting that the gourd-worm had induced epileptic fits, mania, and idiotism."

Upon this passage it is only necessary to observe, that the long tape-worm, *tænia solium*, or, as Dr. Heberden calls it, *lumbricus cucurbitinus*, is not a series of many worms, as this elegant writer suspected, and as, indeed, is generally suspected at present; and although its different joints, when separated from the rest, are capable of maintaining for a short time an independent life, they neither continue alive long, nor are competent to produce any increase. They have, however, been sometimes found alive at the time of expulsion.

There are mischievous effects other than Dr.

Heberden has here pointed out occasionally to be traced in remote organs, from the sympathetic action of worms lodged in the intestines. Thus the lungs, as well as the brain, have frequently been found to participate in the disease, and at times the uterus; and a profuse hemorrhage has ensued from the one or the other organ, and very frequently from the nostrils, and been repeated at uncertain intervals, in some instances without any suspicion of the real cause, and consequently with an erroneous practice. Mr. Rumsey, of Beaconsfield, has published an instructive paper upon this subject (*Transact. of the Medico-Chir. Soc.*, vol. ix.), in which various cases of sympathetic hemorrhage and pulmonary affection seem to have been relieved by an anthelmintic course.

"In all obscure diseases," says Dr. Swediaur, "attended with symptoms that are chiefly anomalous, the suspicion of the physician should be directed to intestinal worms. I once knew a case in which the patient, who was miserably afflicted with pains in various joints of the body, simulating those of arthrodynia, by taking an anthelmintic, and discharging, in consequence hereof, various fragments of a tænia with a mass of mucus, became perfectly well. So," continues he, "have I known apoplexy and palsy removed by a discharge of worms from the intestines: and had once a patient remarkable for a filthy and fungous excrescence on the nose; who lost the excrescence spontaneously after a successful course of vermifuges."*

[Intestinal worms are sometimes so numerous, that they occasion death. This is not uncommon in children from the effect of lumbrici;† and happens even to adults whose bowels contain tæniæ of extraordinary size.]

There is yet great space for improvement in the mode of treating this complaint. The larger worms unquestionably are found most frequently in young persons, or persons of weakly and inelastic fibres, and dysthetic habits; and hence our first intention should be to invigorate the system generally, and the stomach and intestines particularly, by bitter and other tonic medicines: for it is not often that they resist a very strong living action. And yet I have sometimes found the long round-worm in persons who have made no complaint of ill health, of regular habits, and in the middle of life.‡ Worms have occasionally infested the alvine channel for years without any serious evil—the ascarides, indeed, as Dr. Heberden informs us, for thirty years, or for even the whole of a long life, without any reason to suspect that they had hastened its end (*Trans. of the College of Phys of London*, vol. i., p. 54); whence some writers have been fanciful enough to conceive, that, in animals of most genera, they form a mean of maintaining the general health, and are a regular part of the economy of perfect life. [Dr. Rush conceived, that they might sometimes promote health by diminishing the quantity of redundant mucus in the intestinal canal.] "Worms," says Dr. Parr, "seem to form part of a healthy constitution, and are scarcely injurious but from accidental circumstances."* This quaint though common paradox, however, is somewhat shaken by the doctrine contained in the next paragraph; in which a very unnecessary and untenable distinction is drawn between the law which in this respect regulates animals and vegetables; and followed up by a remark at variance not only with general observation, but with the import of Dr. Parr's own reasoning upon the subject. "This circumstance," says Dr. Parr, "forms a striking distinction between animals and plants. Parasitic animals attack only debilitated plants: but the healthiest animals are chiefly affected with worms; and the observations which seem to contradict this, arise from a neglect of the distinction between the existence of worms and their *appearing* a source of disease from their *accumulation*. Their formation is assisted by accumulations of mucus; and, consequently, in children,

* Nov. Nosol. Meth. Syst., vol. ii., p. 245. Cruveilhier takes a very different view of this subject from that adopted by Heberden, Swediaur, and others; for he has no faith in the doctrine which sets down intestinal worms as the cause of a multitude of obscure diseases.

† See two cases in Corvisart's Journ. de Méd., tom. xii., p. 3.

‡ Dr. Elliotson has seen many individuals, who, to their great astonishment, discharged several feet of tape-worm, not having the least idea, previously, that any thing was the matter with them. —Loctures in Med. Gazette for 1832-33, p. 693.

* Worms have even been conjectured to do good by stimulating the digestive organs, and promoting all the functions. The latter idea was that of Goeze, who, in his admiration of the universe, and especially of man, the chef-d'œuvre of the creation, endeavours to prove that all things have been created for man, because all of them are either directly or indirectly useful to him, as, for instance, even intestinal worms. But, as Cruveilhier observes, though it has often happened that numerous worms have remained in the alimentary canal without producing inconvenience, or even causing any symptom indicating their presence, it has much more frequently been the case, that complaints of greater or lesser severity have ceased directly after the expulsion of a considerable number of worms. But here, he thinks, a distinction is to be made between what is truly owing to the expulsion of the worm, and the good done by the vermifuge medicines on some other principle; for many cases are related in which epilepsy, chorea, convulsions, colic, hysteria, and a variety of other diseases, yielded to vermifuge medicines, though no worms were expelled by them. But Cruveilhier conceives that some doubt will always continue respecting what complaints truly depend on worms, inasmuch as the symptoms caused by them cannot be discriminated from such as arise from concomitant causes. He does not admit that there are any *worm diseases* (properly so called), that is to say, diseases which depend entirely on the presence of worms in the intestinal canal. He acknowledges that there are symptoms of worms, though there is nothing very characteristic in them, all being more or less vague. The certainty of the existence of worms can only be acquired by their expulsion; but, it is one thing to determine their presence, and another to ascertain what influence they have in diseases. —(Dict. de Méd. et Chir. Pratiques, art. Entozoaires.)—ED.

sometimes in cachectic patients, they become *inconvenient*."

Inconvenient is a somewhat gentle term for expressing the fearful host of effects which we have just enumerated from Dr. Heberden, and which Dr. Parr himself has in other places arrayed in form and number quite as appalling. But if this *inconvenience* be mostly promoted by an accumulation of mucus, and if children and cachectic patients be mostly exposed to such accumulation, these worms do not seem, properly speaking, to form part of a healthy, but rather of a weakly constitution; nor can the healthiest be said to be chiefly affected by worms. And the same general law applies equally to animal and vegetable life. In both, the most imbecile are the most affected; and the strongest, when affected, are the least injured, for the very reason that they are the strongest.

The disease called *rot*, in sheep, to which I have already alluded, is a further illustration of this remark. Here the fasciola, or fluke, makes its appearance in prodigious numbers in the liver of the animal, which is sometimes entirely preyed upon and destroyed. Though there is some doubt among physiologists whether this worm be the cause or the effect of the disease, all are agreed, that the malady never appears in a wholesome atmosphere, and a strong and vigorous state of health: and it has of late been sufficiently ascertained, that tonic stimulants, and especially the stimulant property of sea-salt, whether mixed with the food mechanically or chymically, as in salt marshes, is the best and most effectual mode of cure. The food of merinos, in Spain, is therefore constantly enriched with salt; and Lord Somerville justly attributes the health of his flock, of upwards of two hundred merinos, which he purchased in Spain, to the use which he has for years made of this article on his farm. A ton of salt is the proportion employed annually for every hundred sheep.

One means, therefore, and perhaps the most powerful in our possession, of getting rid of intestinal worms, is that of strengthening the system generally, and the alvine canal particularly. Our next means is the use of what have been called anthelmintic medicines, or those which either destroy worms, or drive them from the body by qualities which torment or distress them. Both these intentions may sometimes be pursued simultaneously; and where they cannot, from the weakness of the patient, we should commence with the former. A decisive vermifuge process is yet a desideratum: for, first, worms lie for the most part so low in the intestines, or are so completely involved in viscid mucus or other slime, that oil of turpentine, tobacco-water, and mercurials, which readily enough destroy them out of the body, seldom go directly home to them when within it; and next, most of the medicines that promise to produce this effect, have a tendency at the same time to weaken the action of the stomach and intestines, and consequently to render them a fitter habitation for such unwelcome tenants.

Worms, by their irritation, augment the secretion of mucus, in which also they involve themselves. Brera says they feed upon it, and if deprived of it they die.* By keeping the bowels loose we prevent the accumulation of this slimy material in which the worms burrow; and if we have reason to believe that such accumulation has taken place, the best plan is to give active purges, as calomel, jalap, scammony, gamboge, or an intermixture of these, for its removal: and having thus, as far as we are able, exposed the naked bodies of the worms to the action of ANTHELMINTICS, we should proceed with the latter without loss of time.

The list of these is almost innumerable; and the very length of the catalogue serves to show us how little we can place a positive dependance, even at the present hour, upon any one of them as a specific.

Anthelmintics may be conveniently divided into two classes. Firstly, those that dislodge and drive away intestinal worms by some mechanical or other external action; and, secondly, those that destroy them by some narcotic or other internal means.

In the former we may rank all the drastic cathartics; all the oleaginous vermifuges, as oil of olives, beech-nuts, castor, and turpentine; sulphur, petroleum, and sea-salt; tin-filings; crude quicksilver, or Plenck's gray mucilage of it; the lunar pill of Boerhaave, formed from a preparation of silver, which may be regarded as a mild lunar caustic; and the bristly down of the pods of cowhage. In the latter we may place the male-fern, hellebore, fetid hellebore, cevadilla, tansy, savine, rue, dittany, tobacco, wormseed (*artemisia santonica*, Linn.), bark of the bulge-water-tree (*Geoffroya inermis*), and of the cabbage-tree (*areca oleracea*); the *spigelias*, and *scabiosa Indica*.

Simple purgatives, even the most active and drastic, seem to have little other effect than that of clearing away the mucus and other viscid materials, in which most of the intestinal worms are fond of burrowing, and thus exposing their naked and tender bodies to the action of other and more direct anthelmintics. Even colocynth, which unites a bitter principle to a cathartic power, and which on this account was for ages regarded as an anthelmintic doubly armed for the field, is now well known to be incapable of poisoning them—as Redi has exposed various kinds of them to a strong decoction of this medicine for four-and-twenty hours without serious mischief.

It is, nevertheless, obvious that these medicines have their use, and are in fact of very great importance; and especially in the case of children, whose bowels are more easily loaded with mucus than those of adults, and who, on this account, bear active purgatives with much less inconvenience. In an attack upon worms, brisk cathartics should always take the lead. They ought not, however, to be too frequently repeated, nor continued through a long series;

* Lezioni sui Principali Vermi del Corpo umano. 4to., Crema, 1801.

as in this case, they will rather augment than diminish the mucus by their own irritation.

Upon the oleaginous vermifuges we can place but little dependance, if we except the terebinthinates. Olive and castor-oil may be of slight subsidiary benefit, by mixing with the surrounding slime, and removing it by what purgative power they possess; but their chief benefit, if they be serviceable at all, is probably in greasing the bodies of the worms, and blocking up their stigmata or respiratory pores:* in which view, they are better adapted for the cure of worms that infest the stomach and upper intestines, where they can exert their power at once, and without dilution or chymical change, than for those that take up their habitation lower; and especially for the cure of the long round and the long thread-worms, as these are killed more readily than the tape-worms, which often only perish by single joints. For the cure of vermicular ascarides,† or maw-worms and bots, these oils have been used in the form of injections: but we have no decided proofs of any great benefit that has been derived from their use in either way, in respect to the worms, for which, indeed, they are rarely to be recommended, though they are often useful in taking off the irritation of the mucous membrane itself.

The terebinthinate oils are far better entitled to our attention, and appear to act as purgatives upon the bowels, and as external irritants upon the worms exposed to them. The vermicular ascaris rarely resists their use when given in a dose sufficiently large to reach the rectum, or when injected into this organ; and has been discharged in great abundance.* The alvine worms, if not equally affected, are nearly so; even the tænias have yielded to their acrimony.‡ The rectified oil of turpentine is that in common employment. [Convincing proofs of its efficacy in cases of tænia were published by Dr. Fenwick (*Med. Chir. Trans.*, vol. ii.), of Durham, to whom the merit of its first administration has been erroneously referred, not only by the author of this work, but other distinguished men.‡ Turpentine was recommended for its anthelmintic virtues even by Bartholine (*Epist.* iv., p. 345), and Chabert's celebrated remedy consisted principally of it.—(*Journ. Encyclop.* 1781.)] Turpentine is usually given in doses of from half a drachm to a tea-spoonful to an infant, and from an ounce to an ounce and a half to adults, alone, or with a little peppermint or cinnamon-water; though for infants the best medium is milk. These doses, however, may be considerably increased, and will in many obstinate cases be found insufficient. [In the extraordinary case already quoted, Dr. Pickells gradually increased the dose of common turpentine to six ounces.—(See *Trans. of Assoc. Physicians*, &c. Ireland, vol. v.)] A child of ten or eleven years old may take an ounce without any evil effect in ordinary cases: but, in delicate habits, a full dose sits uneasy on the stomach, and disquiets the system generally, though in different ways; for it sometimes produces a general chill and paleness, sometimes a tendency to sleep, and sometimes an alarming intoxication. It is in small doses alone, as half a drachm or a drachm to an adult, that it enters into the circulation, and proves an acrid irritant to the bladder, often exciting bloody urine.§

* This remark does not agree with the conclusion at which Cruveilhier arrives, who reminds us that fixed oils were proved, by the experiments of Arnemann and Redi, to have no specific power against worms, and that castor-oil is efficacious only as a purgative. Human ascarides, immersed in it, lived not less than from forty-four to forty-eight hours. Cold, alcohol, and empyreumatic oils destroy worms instantly. In several instances where worms occupied the great intestines, Cruveilhier found cold clysters successful.—(Dict. de Méd. et de Chir. Pratiques., t. vii., p. 352.)

† Of all the kinds of intestinal worms, the ascarides vermiculares, or oxyures, are the most easy to detect, for their favourite residence is in the folds or the lower part of the rectum, where they produce violent itching, and sometimes excessive pain. When there is reason to suspect them, the lower end of the bowels should always be examined. In several cases mentioned by Cruveilhier, complete relief was afforded by keeping mercurial ointment applied to the anus for a few days. This author has remarked, that ascarides vermiculares very commonly cause inconvenience chiefly in the night-time, after the young patients have been put to bed. He considers it probable, that they only cause uneasiness when situated near the lower end of the rectum; and in this manner he endeavours to account for cases on record, where patients had no ailments, though they passed a vast number of vermicular ascarides.—(Dict. de Méd. et de Chir. Pratiques, art. Entozoaires.) Sometimes these animals get into the vagina, and occasion intolerable itching, and even, as is alleged, nymphomania. In one instance, related by Beck, the injection of a bitter decoction into the vagina brought away a large number of oxyures, and gave prompt relief. A solution of the sulphate of iron is also known to destroy ascarides very promptly.

* For destroying worms, "one of the best remedies is unquestionably oil of turpentine. In the case of ascarides, which are easily known from their crawling out, from their appearing in the stools, and from the extreme itching which they cause in the rectum, it is best to give the oil of turpentine by injection. You thus send it immediately on the part where the worms reside; you save the patient the trouble of a filthy dose, and you save the stomach from great disturbance. From a drachm to half an ounce may be given to a child, mixed with gruel, and it will often bring away thousands. Adults will take an ounce or more in an injection," &c.—Elliotson's Lect. in Med. Gazette, 1832-33, p. 692.

† Diseases of Tropical Countries. By C. Chisholm, M. D., p. 99, Lond., 8vo., 1822.

‡ See Gregory's Elem. of Physic, p. 521, 2d edit. In 1792, Mr. Madden, a surgeon at Putney, seems to have mentioned oil of turpentine as a good medicine for worms (Trans. of Lond. Med. Soc.), but he was anticipated by others, as explained in the text.—ED.

§ Dr. Elliotson recommends it not to be given to the patient when he is fasting, lest it create sickness. When it does not operate well downwards, he gives castor-oil, and repeats it every two hours, till the turpentine has found its way

The subject requires further attention than it has hitherto received; for it is probable that some of the terebinthinate essential oils, while equally deleterious to worms, are less disposed to disagree with the stomach and affect the system, as the Hungarian balsam, or distilled oil of that variety of the *pinus silvestris* which has been called MUGHOS; or the distilled oil of the green cones of the same tree, formerly called *oleum templinum*; and at one time sold at a high price, as a great secret, by German itinerants, under the name of KRUMMHOLZÖHL.

[In 1823, Dr. Kennedy proposed the exhibition of the oil of croton for completing the expulsion of intestinal worms, after their destruction by oil of turpentine, or other anthelmintic medicines.—(*Lond. Med. Repos.*, Feb., 1823.) In Italy, the oil of croton has been tried by Puccinotte (*Annali Universali di Medicina*, Aprile e Maggio, 1825) as a means of destroying tæniæ, as well as procuring their prompt discharge. One drop of the medicine was exhibited in beef-tea, at intervals of two or three days; the first dose expelled many fragments of the worm; and a little perseverance in the plan soon effected a perfect cure.]

The petroleum, pisselæum, and animal oil from horns, all of them highly esteemed as vermifuges in former times, possess like virtues, but in a subordinate degree, and are more unmanageable in preparing them for the stomach. Chabert, Goeze, and Professor Bremser,* of Vienna, who has cultivated this subject more attentively, perhaps, than any other pathologist in Europe, unites some one of these empyreumatic oils with the oil of turpentine, giving a third part of the former with two thirds of the latter: one or two tea-spoonfuls of this mixture being the ordinary dose at night and noon.

[According to Dr. Larini (*Mem. of the Acad. of Turin*, vol. xxv.), the plant called samphire (*Crithmum maritimum*) is a powerful vermifuge, especially in cases of lumbrici; a virtue that seems to depend upon its containing an oil very similar to petroleum.]

The sulphureous and Harrowgate waters, and those of Barèges, appear to act in like manner; they are double irritants, and probably goad the worms while they stimulate the bowels. [Whether pure sulphur, uncombined with oxygen or the alkalis, has a vermifuge power, is doubted.—(See *Dict. des Sciences Méd.*, l. 57, p. 201)]. But the efficacy of all these is far less than that of the essential oil of turpentine.

Concentrated sea-water, or a briny solution of sea-salt in spring-water, has been recommended from very high authorities, and has been found in many instances highly advantageous. It acts upon the same double principle as the preceding, though probably with more energy. The acrimony of sea-salt is troublesome to every variety of intestinal worms. I have already observed, that it is the best prophylactic against the attack of flukes in sheep, while it gives, at the same time, a healthy stimulus to the visceral organs; and where leeches, or indeed any of the erratic division of worms or larvæ are suspected, we are nearly certain of its proving a ready cure from its effects on the same animals out of the body. In the case of maw-worms, it is better to throw up the brine in the form of an injection; but where these are found to be migrating up to the stomach, it should be taken by the mouth. There is a striking example of the benefit of this treatment published by Mr. Leigh Thomas, of Hawarden, Flintshire. The patient is stated to have been reduced to a very high degree of danger, and to have suffered from the disease almost without intermission for five years, perpetually wishing for death to put an end to his tortures. He was cured by the accidental recommendation of this remedy of salt and water, which was stated to have wrought wonders in a similar case. He accordingly swallowed two pounds the next morning, dissolved in two quarts of spring-water: he was vomited and purged violently, but discharged by both apertures a prodigious quantity of ascarides involved in mucus. He suffered at the same time much from the common effects of so large a portion of sea-salt, and particularly from strangury; but finding that he had now obtained an engine with which to move the invading host, he repeated the same dose a few days afterward, and with the same effects, both good and bad. In a few days, however, he lost every painful symptom, and gradually recovered perfect health. —(*Med. Trans. of the College*, vol. i., art. iv., p. 54.)

On what the anthelmintic virtue of tin-filings depends is somewhat doubtful: nor can they be regarded as an efficient medicine. Yet Dr. Alston was much attached to them, and especially as a cure for the tænias, and gave them in doses of from two drachms to an ounce in treacle. He ascribed their benefit to a slight combination with arsenic; but it is now fully ascertained, that the metal is at least as successful in its purest state; and its effects are generally supposed to be altogether mechanical. This is certainly the case with crude quicksilver, though not with the gray mucilage of mercury, or the lunar pill, which probably stimulate the tender skin of intestinal worms, and especially those that are fond of burrowing in the mildest mucus, to some spastic and painful retraction. The last was a favourite vermifuge with Boerhaave; and Baldinger was as fond of the first, and asserts that it is peculiarly efficacious in expelling the long thread-worm.

Perhaps the most powerful and successful of the irritants that act by an external power, is the prickly and pungent down of the pods of the cowhage (*dolichos pruriens*, Linn.), which has long been held in deserved estimation. This plant is a native of India. One of the first accounts, if not the earliest, published of it in this country, is that of Mr. Kerr, at that time a resident at Patna. It was addressed to the Professors of Medicine at Edinburgh, and was

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out. In this manner, he prevents the dangerous consequences which turpentine has sometimes produced.—Lect. Med. Gazette, 1832–33, p. 694.—Ed.

* Ueber lebende Würmer in lebenden Menschen, 8vo., Wien., 1819.

given to the world in the Medical Commentaries.—(*Med. Trans. of the College*, vol. ii., p. 82, 202.) Its powers as an anthelmintic were at the same time detailed by Mr. Cochrane, whose character of it was soon afterward fully confirmed by Dr. Bancroft, from long personal observation in South America.—(*Essay on the Natural History of Guiana*, London, 1770.) After stating the frequency of worms of all kinds in that quarter, and endeavouring to account for it, he adds, that from whatever cause these worms originate, their number is so great, and their power so prolific, that the usual remedies are insufficient for their destruction; for which reason the planters in general have been induced to employ cowhage. "Who first suggested it," says Dr. Bancroft, "I know not, but its efficacy is indisputable. The part used is the setaceous, hairy substance, growing at the outside of the pod, which is scraped off, and mixed with common syrup, or molasses, into an electuary: the dose, a tea-spoonful to a child, and double to an adult, in the morning, fasting, and repeated the two succeeding mornings, after which a dose of rhubarb is usually subjoined." The planters in this manner commonly give it once in three or four months to their slaves in general, and especially to the children of their slaves; and the author tells us, that he has known it thus administered to hundreds, from one year old and upwards. The patients, after the second dose, usually discharge an incredible number of worms, mostly the long round and the long thread-worm, amounting to more than twenty at a time, the stools consisting of hardly any thing else. And irritating as these spiculæ are to our own skin, when involved in the viscid materials with which they are mixed up, they do not seem to form an inconvenient medicine; and Dr. Bancroft never saw any evil produced by it. Of its effects upon the vermicular ascaris, he says he cannot speak, as he has not seen it tried for this variety of invermination. For this last purpose the best mode of employing it is in the form of mucilaginous injections. It was a favourite medicine with Dr. Macbride, who has warmly recommended it.—(*Introduction to the Theory and Practice of Medicine.*)

Of the vermifuges that seem chiefly to operate on worms by attacking them internally, and to expel them by destroying their life, it may be observed, that almost all of these possess great pungency and bitterness; but that those which have obtained this character, and are bitter alone, are but little entitled to it, and are only of use when combined with some acrimonious irritant. We have already remarked, that even the intense bitter of the colocynth does not destroy worms: and Dr. Cullen judged the same respecting the seeds of the *artemisia santonica*, from their repeated anthelmintic power, vernacularly called WORM-SEED, so warmly espoused by Baglivi, and supposed, at one time, to be a specific against the long-worm. "It is said," observes Dr. Cullen, "to be the lumbrici teretes (the long round-worm, *ascaris lumbricoides* of the present system), to which they are especially adapted;" but, from Redi's experiments, it appears that bitters are not an immediate poison to these animals; and Professor Murray properly observes, "that if the semen santonicum (worm-seed) according to Baglivi's experiments, operates more quickly, it must be by something else than its bitterness that this seed operates. I am uncertain if I have ever been possessed of the best kind of this seed, but must say, that what I have seen has hardly ever appeared to me to be a powerful medicine."—(*Mat. Med.*, part i., chap. ii., p. 62.) So far as my own observations extend, I can confirm this opinion. But the seeds are so often adulterated with those of other plants, and especially those of southernwood, that it is difficult to speak with precision.

The same remark may be made in respect to tansy, savine, rue, bastard dittany, or fraxinella (*dictamnus albus*, Linn.), and not the dittany of Crete, which is an origanum, the seeds of the *chenopodium anthelminticum*, or worm goose-foot, angelica, and many other leaves and seeds of slighter efficacy, which have had their day, and are forgotten, some of them undeservedly so. They have all more or less a bitter principle, in combination with some acrid quality, which exacerbates the energy of the bitter, and renders it doubly obnoxious to these internal parasites. And it is to these principles we are to ascribe the efficacy of the pomegranate-root, one of the most common, and, according to Dr. Ainslie, one of the best established vermifuges in India.* Linnæus asserts the angelica (*angelica archangelica*) to be peculiarly serviceable in expelling the gordius, or hair-worm; and that it is in common use for this purpose in Lapland, where this variety of vermination is indigenous.

On what ground asafœtida is to be held as an anthelmintic, I do not exactly know. Hoffman regarded it as one of the most powerful medicines in the vermifuge class; and Dr. Cullen tells us, that he has no doubt of its being entitled to a place in the class, though he confesses that he has seldom found it effectual; which

* According to M. Deslandz, it is used by the negroes of St. Domingo for the same purpose. The bark of the root may be administered in powder, the doses being from eight grains to a scruple, twice or thrice a day. The decoction employed in India against the tape-worm, is made by boiling ʒij. of the bark in a pint and a half of water, down to ʒix., of which ʒij. are given as a dose every half hour, until the worm is expelled, which generally occurs in twelve hours.—(See Thomson's Elem. of Mat. Med., vol. ii., p. 33.)

A decoction of the rind of the pomegranate is considered to be a poison to the tænia. A broad tape-worm was put by Goméz into a decoction of it, when it instantly became stiff and motionless. —(See Dict. de Méd. et de Chir., t. vii., p. 352, art. ENTOZOAIRES, par Cruveilhier.) Mr. Breton placed live tæniæ in a decoction of pomegranate bark, and also in a mixture of the powder with water, and he found that when the tæniæ were plunged in these preparations, they died in five minutes.—(Med. Chir. Trans., vol. ii.) That their death arose from the influence of the bark is evident, as these worms live several hours after expulsion, when kept in simple tepid water.—(See Thomson's Elem., loco cit.)—ED.

however he imputes to our not having it in so recent and diffusible a state as were to be wished. It is very probable, indeed, that it loses much of its virtue with the loss of its freshness; for Kæmpfer informs us, from his own observation, that a single drachm of the recent juice smells stronger than a hundred pounds of such as is commonly sold in Europe. Like the preceding medicines, therefore, it is not improbable that whatever anthelmintic virtue asafœtida possesses when fresh, depends upon a bitter principle combined with a pungent and volatile aroma.

The hellebores, helleboraster, and cevadilla, which is usually regarded as a species of veratrum, or white hellebore, though the specific characters have not been very clearly ascertained, are pungent bitters united with a strong cathartic power, and are hence very active vermifuges; but they are too violent for common use, for they often do more mischief than the disease for which they are a remedy. The seeds of the cevadilla are so pungent as to be caustic in their pure state, for they are usually contaminated with parsley and helleborе-seeds; and are hence often employed in decoction, or some other form externally, to destroy bugs, lice, and other vermin. The dose, for a child from two to four years old, is two grains; at eight, five grains; from eight to twelve, ten. These are all powerful errhines. Tobacco is possessed of all these qualities, and unites with them a deadly narcotic power. It is hence, therefore, a decisive vermifuge; but, from its violence, can rarely be used except in injections, in which form it succeeds admirably against the small ascarides.

Gamboge seems chiefly to act as a drastic purgative, bearing down all before it; for though, when held some time in the mouth, it discovers considerable acrimony, it has few pretensions to bitterness. Yet, as it is said to be peculiarly efficacious in detaching and expelling the tape-worm rather than the other kinds, it probably acts also by some specific power with which we are not acquainted.

Some medicines, however, may be regarded as specific vermifuges; or, in other words, as acting upon worms, and detaching or destroying by some simple quality which proves highly offensive or poisonous to them, without affecting the bowels; and which, therefore, prepare them for rejection by any purge that may be given afterward; the chief of which seem to be the bark of the shoots of the cabbage-tree (*areca oleracea*, Linn.), the bark of the bastard cabbage-tree (*Geoffroya inermis*, Linn.), and the male fern.

The two former are West Indian and American plants, and the barks are employed in the form of infusion, decoction, syrup, and even powder. Both have a mucilaginous and sweetish taste, and the first a disagreeable smell. Their destructive power depends upon no sensible quality; for though, when given in large doses, they will vomit and purge violently, they prove far less anthelmintic in this proportion than when administered in doses that lie easy on the stomach and bowels, and do not pass away with rapidity. By such retardation the worms are exposed to their full influence, and are either killed or rendered sickly,—so that it is necessary to take a dose of jalap, or calomel, or both, for their removal. The vermifuge is given in the morning, for eight or nine days in succession, and the purgative on the day ensuing. From the offensive smell of the geoffroya, it has also been called bilge-water-tree. It was first brought into notice in our own country, as a common and almost infallible vermifuge in Jamaica, by Mr. Duguid (*Essays, Physical and Literary*, vol. ii.), and afterward more fully described and recommended by Dr. Wright.—(*Phil. Trans.*, vol. lxxvii.) The decoction is made by boiling an ounce of the fresh-dried bark in a quart of water till it acquires the colour of Madeira wine; the syrup is prepared by adding sugar to the decoction. The former has found a place in the extant Edinburgh Pharmacopœia.

The *areca oleracea* has been long known to the world as a valuable plant for other purposes than the present. Its medulla, or pith, forms an excellent sago; and its green tops are cut and eaten as cabbages; whence, indeed, its vernacular name of cabbage-tree. For a knowledge of its virtues as an anthelmintic, we are, however, chiefly indebted to Dr. Rush, who principally tried it in the form of syrup, which is of a pleasant taste, and which he asserts to be an infallible antidote. It is used, he tells us, very generally by physicians in the West Indies; and he himself has employed above thirty pounds of it, without knowing it to fail in a single instance. It is especially available against the long-worms. It was, antecedently to this, tried at Edinburgh, in the form of powder, but relinquished, as too rough and violent a medicine. In that of a syrup it is sufficiently mild, and neither purges nor vomits, but in an overdose.—(*Edin. Med. Comm.*, vol. i., p. 329.) Dr. Monro has since introduced it into St. George's Hospital, and in various cases found it successful.—(*Edin. Med. Comm.*, vol. ii., p. 97.)

The *filix mas*, or male fern, is not the only species of the ferns whose roots have been employed as simple vermifuges; for the *osmundis regalis* has acquired, with some practitioners, as high a reputation; but the favour of the public has been so much more extensively bestowed on the former as to enable it altogether to eclipse the pretensions of its rival. It is very difficult to say on what the destructive power of the male fern over worms, and especially the tæniæ, depends; for, to the taste, it discovers but little activity, and has little or no aroma. It is glutinous, sweetish, very slightly bitter, and subastringent; may be taken in very large quantities, and appears to be incapable of expelling worms, how much soever it may destroy them, without the aid of active cathartics. And hence many writers of authority, and among the rest Dr. Cullen, are doubtful of its possessing any anthelmintic power whatever.—(*Mat. Med.*, part ii., chap. i., p. 41.) The German writers, how-

ever, give examples of tænias discharged whole, or in long portions, and perfectly dead, after an exhibition of repeated doses of this medicine, where no cathartic whatever was made use of; and Dr. Parr asserts that he has met with like examples in his own practice. And hence it appears to exercise some poisonous effect on worms, though harmless to the human stomach.

About the year 1770, the male fern was brought into great notice in Switzerland and France, by the celebrated Madame Nouffleur, who, under her own process of using it, boasted of it as a specific, but kept the process to herself. The secret was at length purchased by the King of France, and liberally communicated to the world. The patient, according to M. Baumé's statement,* after being prepared at night by an emollient clyster, and a supper of panada, is, early the next morning, to take three drachms of the fern at a dose, and to repeat it instantly, if the stomach should reject it. Two hours after which he is further to take a bolus, consisting of twelve grains of calomel, twelve grains of resin of scammony, and five grains of gamboge, which, it must be confessed, seems admirably calculated for a triumphant issue in some way or other; for it will probably either kill the worm or kill the patient. It is by no means necessary to give so violent a cathartic.†

It is far less difficult to account for the real or supposed specific virtues of the Indian pinks, or worm-grasses, for there are two species of the spigelia that have been employed for this purpose,—*s. anthelmia*, and *s. marylandica*; and for those of the Indian scabious shrub, called by the natives cattu schiragaam. These are all acrid narcotics; in large doses, as above, two drachms, or two drachms and a half, sometimes purging violently, sometimes producing vertigo, dimness of sight, drowsiness, and clonic convulsions; and sometimes producing all together: and hence, the same violent effects being excited, perhaps, in the parasitic worms as in the patient, it is not to be wondered at that they should fall a sacrifice to them, or endeavour to save themselves by a timely and rapid escape. The scabious shrub, however, seems to act more feebly than the Indian pinks, and is little to be depended upon; while the latter are far too acrimonious for general use.

Before closing the subject, I will just observe that Dr. Friske, of Brunswick, has lately employed electricity as an anthelmintic, or rather with a view of killing the worms in their mucous domiciles, by passing powerful shocks through the abdomen. He thinks he has by this plan destroyed even the tænias; yet he does not choose to rely upon this practice without the use of active cathartics.

* Elémens de Pharmacie.—Précis de Traitement, &c., publié par ordre du Roi. Paris, 1775.

† The method of Bourdier, formerly physician to the Hôtel Dieu at Paris, consisted in giving the patient, before breakfast, ʒj. of sulphuric ether in a glassful of the decoction of the root of the male fern. A few minutes afterward, a clyster, similarly composed, was administered; and, in an hour, ʒij. of oleum ricini. This plan was continued for three days.—ED.

There is also a much milder remedy, that has been adopted in Germany, upon the efficacy of which I cannot speak from personal knowledge, but which is well worthy of attention; and especially in respect to patients of irritable stomachs and emaciated constitutions; and that is, the use of mare's milk, particularly in cases of tænia.

[Notwithstanding the kind of argument brought forward by Cruveilhier against the reality of worm-diseases, the most experienced practitioners agree that worms frequently derange the constitution, and that if you can free the patient from them, his health will return. But there is reason to believe that, in many instances, worms are induced by bad health. Hence, as Dr. Elliotson explains in his valuable lectures, there are often two indications in the treatment: one is, to expel the worms; the other is, to endeavour, by every possible means, to restore the health; "to take care that the patient has wholesome food, and to put the digestive organs into the best order you can. If this be done, you will frequently find worms disappear, without any other means being employed. Without giving any purgative medicine whatever—without doing any thing to expel or destroy worms, you will find, in a great number of cases, where children have become their prey, they will spontaneously cease. Children are far more subject to ascarides* and lumbrici than adults, and a great number of children have them at a particular time; but as puberty arrives, the constitution is less favourable as a habitation for worms, and they cease spontaneously."]

GENUS XII.

PROCTICA.

PAIN OR DERANGEMENT ABOUT THE ANUS, WITHOUT PRIMARY INFLAMMATION.

THE name of this genus has been taken from Linnæus: Segar and Macbride have formed a like genus, under that of Proctalgia. In the scope in which it is here employed, the author included six species; all of them occasionally met with as idiopathic diseases, though several of them, perhaps, more generally as symptoms or sequels of other affections. [The species proctica simplex, or simple pain at the anus, has now been omitted by the editor as an unnecessary distinction, throwing no light either on pathology or practice. The species are therefore reduced to five:—]

1.	Proctica Spasmodica.	Spasmodic Stricture of the Rectum.
2.	——— Callosa.	Callous Stricture of the Rectum.
3.	——— Tenesmus.	Tenesmus.
4.	——— Marisca.	Piles.
5.	——— Exania.	Falling down of the Fundament.

* Enemata of lime-water, or of lime-water and milk, as recommended by Dr. Eberle (*Practice of Medicine*, vol. ii., p. 350), will be found valuable for removing ascarides.—D.

SPECIES I.

PROCTICA SPASMODICA.

SPASMODIC STRICTURE OF THE RECTUM.

PAIN IN THE RECTUM REMITTENT, SOMETIMES INTERMITTENT; INCREASED DURING EXPULSION OF THE FECES; VOLUME OF THE FECES SLENDER BUT VARIABLE; RIGID GRASP OF THE SPHINCTER ON INTRODUCING THE FINGER; STRUCTURE OF THE BOWEL SOUND.

Strictures of the rectum are produced by a spasmodic contraction of its sphincter muscles, or by a thickening and induration of its coats. The first forms the species before us: it is the simplest and least formidable of the two affections, though generally very obstinate; it also occurs by far the least frequently, and has hence attracted but little of the attention of medical writers. The second, which often terminates in a scirrhous disease, will be found to constitute the next species.

The glandular structure of the rectum renders it peculiarly irritable, and the natural arrangement of the fibres of its sphincters gives it an habitual tendency to contract. It is hence easy to conceive, that any undue stimulus may excite an inordinate degree of contraction in the sphincters, which may be propagated to a greater or less degree of ascent through the muscular tunic of the bowel. This inordinate action will, at first, be disposed to cease on a cessation of the stimulating cause; but if the stimulating cause be frequently repeated, or of long duration, the contraction may become permanent, and continue to exist after the cause has been removed.

A like predisposition to inordinate and permanent contraction may take place, as Mr. Copeland has ingeniously remarked (*Obs. on the Principal Diseases of the Rectum and Anus*, sect. iv.), from the peculiar structure or peculiar extent of the sphincter fibres in particular individuals. Anatomists have not come to a unanimous agreement, whether these fibres, issuing from the exterior and the interior surfaces of the extremity of the rectum, and freely decussating and intermixing in its substance, be two distinct muscles, or only a single one. The older anatomists seem to have been of the latter opinion; Dr Baillie, M. Petit, and M. Portal speak of them, and describe them as distinct sphincters. Be the fact as it may, we sometimes find that the two layers of fibres do not act correspondently, and that the contractile power of the one follows, instead of keeping pace with, that of the other, or evinces some other mode of inaccordancy, so that the entire muscle is seldom left in a state of perfect rest and relaxation. And we also find, that, in some individuals, even where the action is harmonious, the contractile organ is too broad or too powerful to be overcome by the expulsory power of the abdominal muscles; and consequently, that the feces are expelled less frequently and less freely than they ought to be; whence a habit of costiveness is induced, and the confined excrement, becoming acrimonious by its lodgment, forms a permanent source of irritability, and is constantly augmenting the contractile propensity.

Any other local irritation, under such an irregularity of muscular structure, must have a like effect: as a daily use of acrid purgatives, in small quantities, with a view of counteracting costiveness; irritable caruncles, or excrescences at the verge of the anus; a turgescent and especially a varicose state of the internal hemorrhoidal vessels. And even where there is no such irregular construction of the sphincters as we are now contemplating, any of these accidental sources of stimulus, in a debilitated and irritable habit, or a debilitated and irritable state of the alimentary canal, in which all of them are most prone to occur, may lay a foundation for the same complaint.

Mr. Copeland has favoured the world with some valuable remarks upon this disease (*Obs. on the Principal Diseases*, &c., sect iv.); but the only writer who has hitherto distinctly described it, by what may be called a close and full length portrait, is Dr. Baillie (*Med. Trans.*, vol. v., art. ix.); and I shall avail myself of his words, as containing a correct expression of the complaint.

After noticing that strictures of the rectum are almost constantly produced by a thickening of its coats, in the progress of which ulceration very commonly takes place on the inner surface of the bowel, and the patient is ultimately destroyed, as the ulcer has no tendency of itself to heal, and the art of medicine has hitherto failed in communicating to it any healing disposition, this distinguished pathologist proceeds as follows:—

"Another kind of stricture, however, occasionally occurs in the rectum, much less formidable in its nature, which is very rare, and has hitherto been taken little notice of by practitioners. This is not attended with any diseased structure of the coats of the rectum, but depends upon a contraction, more or less permanent, of the sphincters of the anus.

"A good many years ago, a very well marked case of this kind fell under my notice, an account of which it may not be improper to communicate to the college.

"The patient in whom this disease occurred, had been long subject to an herpetic eruption on his right leg. This suddenly disappeared, and a certain quantity of blood was then daily evacuated by the bowels at the time of passing a stool, for five or six months. When the discharge ceased, there came on a good deal of difficulty in having a motion, which was immediately followed by a considerable sensation of pain in the very lowest part of the rectum. This pain generally continued from a quarter to half an hour, and then subsided entirely until the next time of having a motion. When the stools were examined, they were found to be very small in their diameter, to be flattened upon their surface, and to be serpentine or twisted. In the course of the disease, when there was an effort to have a motion, the external sphincter of the anus would sometimes hardly open

itself, so that fluid feces only would escape at such times, and in small quantity; or if any solid feces were allowed to pass, they were so squeezed by the very narrow aperture of the sphincter as to become nearly as thin as a riband. At other times, the sphincter was much more disposed to open itself, and the stools were then of a considerably larger size, and of a less flattened shape. At no time, however, were the motions of the usual size, or of a perfectly cylindrical form. An examination of the rectum was occasionally made per anum, and the rectum was always found to be so much contracted as to admit with difficulty the forefinger. This contraction extended to the upper limit of the internal sphincter of the anus, above which the cavity of the bowel was of its usual size. The internal membrane of the rectum in the contracted part was perfectly healthy. It was soft, not thicker than usual, and moved very readily on the inner surface of the contracted sphincter. The patient was in good general health, looked well in his countenance, was not the least emaciated, and his pulse was of the natural frequency.

"The patient was very averse to the introduction of a bougie, and this instrument was never passed into the rectum. Nothing therefore was done, except keeping the bowels free from costiveness, and pursuing a very temperate mode of living. The disease gradually became very much less, and although it has not altogether subsided, yet hardly any inconvenience is felt from the remaining degree of contraction. It is now nearly seventeen years since the commencement of the disease.

"This case is very different in its nature from the usual stricture of the rectum, and it is of considerable importance that it should be distinguished from it in practice. In the one case, the prognostic would be favourable; and in the other case, it would be generally very much the contrary. Upon a slight degree of attention, the two cases might be confounded; but when accurately examined, they may at all times be clearly distinguished from each other. In both cases, the feces will be found to be flattened in their shape, small in their size, and in some degree serpentine or twisted; but the other symptoms will be found to be very different. In the common stricture of the rectum, the situation of the stricture is generally two or three inches above the outer sphincter, and there is a sound capacious portion of the bowel between the stricture and this sphincter. At the seat of the stricture the coats of the rectum are felt to be more or less thickened, and, not uncommonly in the cavity of the stricture, there is a hard irregular ulcer. Although this disease has in its early stages little influence upon the constitution, yet when it has made a further progress, the powers of the constitution become very much weakened, great emaciation generally takes place, and the patient is destroyed. In the other species of stricture produced by a contraction of the sphincters of the anus, the contraction is found upon examination to be at the anus, or very lowest extremity of the rectum, the inner membrane of the rectum is discovered to be sound (See *Fr. Salmon on Stricture of the Rectum*, p. 19, Lond., 1828, 8vo.), and the general health is not impaired."

In a particularly obstinate case of spasmodic stricture of the rectum, that fell under the care of our author, bougies of all sizes and descriptions were tried; and some tubercles, which were situated at the verge of the anus, were repeatedly cut away; but without success. He adds: I cannot, however, but regard this as an extreme case; and, in those of less violence, should still recommend the daily use of bougies of as large a size as can at first be borne without much inconvenience, gradually increasing them in diameter: for where the resistance is capable of being overcome, this is the most effectual method. In the meantime, vapour baths, or the warm bath of a bidet, may occasionally be used with advantage; and where there are exacerbations of pain, they may often be taken off by small opiate injections, not exceeding an ounce or an ounce and a half in quantity.

In the case above referred to, little benefit was ever derived from local applications of any kind, whether in the form of vapour, warm water, or cataplasms. It was most unfortunate that opium could not be had recourse to; for in every proportion, whether large or small, it threw out a lichenous rash over the surface of the body, but more especially over the extremities, possessing a heat, itching, and pricking more intolerable than the prickly heat of the West Indies, and which was almost sufficient to excite madness. From the dilatation produced in the orbicular fibres of the iris by a drop or two of infusion of belladonna, I recommended that the bougies, when they were employed, should be smeared with a preparation of the same plant; but no sensible benefit was hence obtained. The belladonna was afterward employed in the form of pills, each containing a grain of the extract. One of these, introduced into the rectum by a small ivory tube with a piston, that thrust it out when it had ascended about an inch high, was at first employed every night alone; in a few days, night and morning; and then one in the morning and two at night. No effect of any kind was experienced till the dose was thus enlarged; and here all the mischievous results of belladonna were produced, and nothing else. The tongue swelled, and lost its power; the head was confused and giddy; the mind wandered; and the sight and hearing were obtunded. Having been warned of such possible effects, and the means of removing them if they should occur, the friends of the patient had immediate recourse to the plan laid down; and, by the aid of copious stimulating and cathartic injections, and cordial draughts, a recovery was accomplished in about twelve hours.

It is obvious, however, that this case was governed by an idiosyncrasy not often to be met with: and hence, notwithstanding the failure both of opium and belladonna in a single in-

stance, I should feel it my duty to try either or both, with unhesitating freedom, in other examples, and should do it with a strong confidence of benefit. Mr. Copeland informs me, that he has often been successful with the latter; and, in some instances, where every other attempt at relief had failed.

I will just notice farther, that, in the above case, after a trial of almost all the aperients in the Materia Medica, the most convenient has been found about eight or ten grains of the black sulphuret of mercury, with about two drachms of sublimed sulphur in addition.

I have the satisfaction of adding, that, since the above particulars were written, the disease, though not entirely subdued, has been considerably diminished, and comparatively produces but little inconvenience.

Other cases that have occurred to me of the same complaint, have been less painful and far more easily overcome. In a young lady of eighteen, whom I now see only occasionally, and who could never be persuaded to use a bougie, it has given way, after nearly two years' standing, principally by the use of the hip-bath, for half an hour every morning, before she made an effort to evacuate the bowels.

SPECIES II.

PROCTICA CALLOSA.

CALLOUS STRICTURE OF THE RECTUM.

DIFFICULT AND PAINFUL EXPULSION OF THE FECES; FECES LAX, OR OF INVARIABLE SLENDERNESS; PERMANENT CONSTRICTION FELT BY THE FOREFINGER ABOVE THE SPHINCTER; STRUCTURE OF THE BOWEL THICKENED AND INDURATED IN THE CONSTRICTED PART.

A CAREFUL attention to the pathognomonic characters laid down in the above definition, will easily distinguish this species from the preceding, which, though more troublesome in its commencement, is far less formidable in its issue; since the latter, if not timely attended to, is frequently found to terminate in an ulcerated scirrhus, and sometimes a cancer.

The disease for the most part commences its attack so insidiously, that the patient has no suspicion of the real nature of the case. He feels a troublesome costiveness, which he ascribes to almost every thing rather than the real cause, and endeavours to alleviate it by various kinds of cathartics. These, while they afford temporary relief, add, by the habitual irritation they produce, to the primary and unsuspected malady; and the next symptom perhaps is that of piles, or what is so conceived from a varicose state of the hemorrhoidal vessels, and the natural tendency of all mucous canals to evince most excitement at their extremities.

In the meantime the morbid part of the gut continues to thicken and harden in its coats, its bore diminishes in diameter, and the efforts to expel the recrement become more violent. The stools are now of a still slenderer and often of a twisted or serpentine form, and have the appearance of convoluted earth-worms, or butter squeezed by a piston through a confectioner's syringe.

Thus far, however, the constitution suffers perhaps but little; and the patient, to his friends, may appear to be in the zenith of health. But if the rectum be tried by the finger or a bougie, a morbid change of structure will be perceived, that threatens the most alarming results. The sphincters will probably be found pliable and free from disease, and the part of the gut immediately above them, for two, three, or more inches, will be equally healthy; but the stricture, as soon as it is reached, will, perhaps, scarcely admit the passage of the finger, and oppose its entrance by the semblance of a hard cartilaginous ring; or if it be not thus indurated and rendered scirrhous, it may be studded by a circle of tubercles, or intersected by a network of membranous filaments. And if a sound or bougie be passed through the neck of the stricture, another stricture may be found higher up, and again repeated to the sigmoid flexure of the colon; where perhaps the disease originated, and whence it has worked its way downwards; the colon possessing naturally its least diameter at this point, and the feces being here most easily delayed in their progress, not only from this increased narrowness of the passage, but also from the curved line in which they have to move forward into the rectum.

Whether the stricture be thus complicated or not, the narrower its aperture becomes, the greater the difficulty of passing the feces, which necessarily accumulate and distend the bowel above, excite eructations and gripings, and occasionally lay a foundation for that species of colic which we have already described as issuing from this source, under the term *colica constricta*. The feces can now be discharged only in a fluid state; and there is a sanious oozing from the anus, accompanied with a certain degree of tenesmus, which is rather troublesome than severely painful.

"At this period," observes Mr. Copeland, who has admirably described the progress of the disease,* "abscesses very frequently form in the neighbourhood of the anus, and sometimes break into the vagina of the female, and the feces are discharged through the fistulous orifice. In the male, an adhesion takes place to the bladder, and the abscess (*Petit, Œuvres Posthumes*, tom ii., p. 93) discharges itself with the urine, and sometimes feces and wind are voided by the urethra. But more frequently the matter makes its way through the nates, as in cases of common fistula, for which disease it is not unfrequently treated. The patient often continues a long time in this distressing situation, for none of the vital organs are affected; till, at last, worn out with the pain and the discharge, or perhaps a total obliteration of the rectum, he yields to his fate. This is usually the progress and issue of the disease when it is not early discovered; and, I must confess also, sometimes

* Observations on the Principal Diseases of the Rectum and Anus, sect. i., p. 11.

the termination when it is: that is, when the parts are attacked with cancerous ulceration."

[In one case, however, which the editor attended at Halliford, the tenesmus was particularly severe. The disease, indeed, corresponded very closely to the following description. With the usual symptoms of stricture, there were the most acute lancinating pains in the part, extending through the pelvis to the loins and thighs; and every now and then the pains were followed by a sudden gush of bloody discharge from the bowel. When any feces passed, the suffering was extreme; and for several months previous to the fatal termination of the disorder, there was a peculiarly fetid discharge from the anus. The patient was a gardener, more than seventy years of age; and he did not sink till his stomach became disordered. During the latter stages of the disease, the functions of the bladder were very much disturbed. The passage of a bougie into the rectum could never be endured, and even a clyster-pipe was intolerably painful.

The causes of the present disease are completely unknown. It is generally remarked by writers that it may originate from any kind of irritation of the rectum; yet, without some other circumstances conducive to the changes of structure, forming what is usually called a scirrho-contracted rectum, simple irritation of the bowels will not bring on this afflicting disease. The case is sometimes suspected to arise from a peculiar morbid condition of the mucous glands of the rectum.—(*Salmon, on Stricture of the Rectum*, p. 63.) Dr. Baillie entertained this opinion, which he thought was confirmed by the fact, that such glands are most numerous at the lower part of the gut, where the disease is also most frequent. If this be the case, however, it only refers to the structure in which the disease commences, and throws no light on the cause of its commencement. The probability is, that the complaint is dependant on constitutional causes, like every other form of scirrhus. Desault found the disease to be much more common in the female than the male sex, in the proportion of ten to one: the subjects of it are also mostly advanced in years. This tends to support the opinion already delivered, respecting the operation of constitutional causes. A case was communicated to Dr. Monro, by Dr. Gregory, where the disease was ascribed to the insertion of a fish-bone in the coats of the rectum, as discovered after death.—(See *Monro's Morbid Anat. of the Human Gullet*, &c., p. 22.) The particulars recorded, however, do not warrant this inference, since the stricture might have occasioned the stoppage of the bone, and not the bone the formation of the stricture. This, at least, is the editor's view of the subject, and it is confirmed by various examples in which cherry-stones or other foreign bodies have been detained in other parts of the intestines by strictures.—(See case by *Salmon*, op. cit., p. 31.) The idea of the disease ever originating from syphilis is now abandoned by every surgeon of judgment. Mr. Salmon refers to two specimens of the disease in an advanced stage: in both cases the mucous and muscular coats of the bowel have been absorbed, in consequence of the pressure of a new-formed substance, which, in one instance, has made its way into the bladder, and, in the other, into the vagina.—(Op. cit., p. 63.) These two cases, then, present one feature of carcinoma of the breast, namely, that which consists in the substitution of a new-formed substance for the original texture, which is absorbed. The projection of the new mass into the bladder and vagina, however, would rather indicate a character of fungus hæmatodes.]

The existence of transverse filaments, like that of cancer, is generally preceded by scirrhosity, as remarked in the following passage of Dr. Baillie. The scirrhus "sometimes extends over a considerable length of the gut, viz. several inches; but generally it is more circumscribed. The peritoneal, muscular, and internal coats are much thicker and harder than in a natural state. The muscular, too, is subdivided by membranous septa, and the internal coat is sometimes formed into hard, irregular folds. It often happens that the surface of the inner membrane is ulcerated, producing cancer. Every vestige of the natural structure is occasionally lost, and the gut appears changed into a gristly substance." These remarks are strikingly illustrated by well-engraved figures in the author's Morbid Anatomy.—(Plate iv.)

In a few cases of irritation, the transverse filaments have been formed before the thickening of the gut has become callous, and have nevertheless been accompanied with all the painful symptoms just noticed. If, in this incipient state of the disease, these filaments be carefully removed, it has often happened that an easy and radical cure has followed in a short period, of which Dr. H. Y. Jameson, of Baltimore, has published a striking and instructive example.—(*American Medical Recorder*, April, 1822.)

Ruysch gives an instance of a scirrhous stricture of the rectum, which produced great agony, and terminated fatally, excited, as he supposed, probably without sufficient grounds, by a stricture of the urethra. On dissection, the pelvis of each kidney, and the middle of the right kidney, were found loaded with calculi; the rectum, through its entire length, was nearly of the thickness of the thumb, and so indurated as to render it difficult to say whether the incrassation should be called flesh or cartilage: the canal was not wider than a straw; and so firmly had the intestine adhered to the sacrum, that it could only be separated by a mallet and chisel, the point of a knife having been previously tried in vain.—(P. 358.)

[When the texture of the scirrho-contracted rectum is considered, it must be confessed that there is not only great difficulty in putting faith in the efficacy of any internal medicines, but also in giving credit to the statements of benefit derived from direct applications to the diseased part itself. Experience must be heard, however, and the authority of Desault can be brought forward in confirmation of the power

of tents and bougies to relieve and even cure this formidable disease. Notwithstanding what was once asserted, pressure will not cure cancer of the breast; and it is puzzling to understand why it should ever succeed in cancerous affections of the rectum, unless the latter be presumed to be of a different nature from scirrhous affections of other organs. Yet Desault declares that the disease can be cured, and has recorded examples of the successful treatment of what he conceived to be scirrhus of the rectum. It is not every surgeon, however, that bows to this doctrine; and Professor Gibson delivers his own judgment very unreservedly when he remarks that, whatever may be said to the contrary, genuine scirrhus, or cancer of the rectum, is absolutely incurable.—(*Institutes and Practice of Surgery*, vol. i., p. 293.) A similar prognosis is given by Mr. Salmon.—(Op. cit., p. 64.) In the example which I attended at Halliford, the bougie could never be endured. Some palliation of the sufferings was produced by the exhibition of hyoscyamus, joined with hemlock, opium, or the blue-pill; and by the occasional use of castor-oil, anodyne clysters, the slipper-bath, and fomentations. Our author, as the annexed remarks show, had confidence in the bougie.]

In the earlier stages of this disease, the steady use of a bougie, firm, but not harsh, and lubricated with oil, of a size adapted to the diameter of the stricture, so that it may press against its sides with a force short of uneasiness, will afford, in conjunction with gentle laxatives, the best chance of cure, and has in very numerous instances completely succeeded. The bougie may be retained at first for only a few minutes, as, on its earliest use, it will probably give pain, and irritate; but by degrees it should be borne for a longer period of time, and at length for several hours in a day. The pressure will promote absorption, and consequently reduce the morbid thickness of the coats, and hereby enlarge the diameter of the intestine; and as this last change occurs and advances, it should gradually be met by a bougie of larger calibre, till the canal is restored to its proper dimensions. And even after this, it will be proper to return to the bougie occasionally, for a few minutes at a time, that there may be no relapse from the existence of a predisposing habit.

Nothing is so well calculated as the bougie, moreover, to break away that network of filaments which, as we have already observed, is sometimes united with an incrassation of the rectum, and spreads from one side of it to another. In this case there will usually be found at first a considerable degree of pain, and sometimes a considerable degree of hemorrhage; but a courageous perseverance will triumph over these, and amply reward the patient's exertions. And the tubercles, which are so apt to form on the loose and inner coating, will often yield and be carried off by the same means.

When, however, the disease does not yield to this plan, or has reached a more serious stage in its destructive progress, it becomes a direct subject of operative surgery: and a cure may yet be obtained by a removal of the tubercles by ligature or the knife; or a division of the thickened ring by a curved and probe-pointed bistoury. When, indeed, the disease is of so complicated a character as to embrace at the same time a contraction of the sphincter, M. Boyer has proposed also to divide this muscle; and asserts that he has often done it with success. But as it is not the intention of the present work to enter upon the province of practical surgery, I shall not pursue the subject any further.

SPECIES III.

PROCTICA TENESMUS.

STRAINING.

PAINFUL AND PERPETUAL URGENCY TO GO TO STOOL, WITH DEJECTION OF MUCUS ALONE, AND IN SMALL QUANTITY.

When this complaint is idiopathic, it is the result of local irritation, mostly produced by cold; the passage of acrid stimulating matter from the bowels; the mechanical pressure of confined enterolithi, or minute scybala; or an injudicious use of acrid cathartics, especially of aloes, which have a peculiar tendency to stimulate the lower part of the rectum. It is sometimes intolerably vehement, and accompanied with a protrusion of the gut; the mucous discharge is bloody, and the straining continues long after the intestine has emptied itself of every particle of its contents. And even when the patient has risen from stool, he will still perhaps be tormented with a burning pungent heat, and a perpetual urgency to expulsion. It is this violence of attack, indeed, that chiefly distinguishes this species from the symptomatic straining that occurs in the preceding, which is attended with but little comparative pain, and generally ceases upon the discharge of even a small portion of feces. The constant urgency and torment wear away the sufferer's strength, and sometimes extend the irritation to the bladder.

Most commonly, however, tenesmus is nothing more than a symptomatic affection, excited by some disorder of the bladder, as inflammation in its neck, or a calculus in its cavity; or by dysentery, chronic diarrhœa, costiveness, piles, worms (especially ascarides), and pregnancy; or, as just observed, by a stricture of the rectum, or its sphincter.

In all these cases, tenesmus can only be removed by a cure or palliation of the disease on which it is dependant: but where it is an idiopathic affection, a more direct course of treatment may be adverted to. If a lodgment of acrid materials form the cause, these should be freely discharged, and the irritation they have excited be subdued by bleeding with leeches, and a local application of opium, intermixed with soap and wax to prevent its being too quickly dissolved; or by small doses of ipecacuanha, or of Dover's powder. In very painful extremes, opiate and mucilaginous injections will often alleviate the distress; or Goulard

water with oil. Laudanum in a solution of starch is frequently employed with great benefit as a clyster; or the extract of opium may be introduced into the rectum as a suppository.

SPECIES IV.

PROCTICA MARISCA.

PILES.

LIVID AND PAINFUL TUBERCLES OR EXCRESCENCES ON THE VERGE OF THE ANUS; USUALLY WITH A DISCHARGE OF MUCUS OR BLOOD.

THIS species has generally been described by modern writers under the name of *hæmorrhois*, whence *hemerods* or *emrods*, in old English, and *hemorrhoids* in the English of our own day. Now, the literal meaning of *hæmorrhois*, αἱμορροΐς, is "flux of blood;" and in this sense the term was used by the Greek and Roman writers, sometimes generally, and sometimes with a special application of it to menstruation, and particularly profuse menstruation, or uterine hemorrhage, but never with a *special* reference to hemorrhage from the anus, as I have already remarked in the Preliminary Dissertation to the volume of Nosology (page 55), to which I refer the reader; and hence again, Aristotle denominates, by the term hæmorrhois, a serpent, whose bite was said to be succeeded by a violent and fatal flow of blood from the bitten vessels.—(*De Partibus Animal.*, lib. iii.) The name is, therefore, highly inadequate to the purpose of expressing, with any degree of clearness, tubercles, or even discharges from the anus; yet it becomes not only inadequate but absurd, when employed generally to indicate a family of diseases, some of which have a discharge of mucus instead of a discharge of blood, and others no discharge of any kind.

For these reasons, as well as others stated at large in the comment to the volume of Nosology, I have deemed it expedient to adopt the Latin term *marisca* in the stead of *hæmorrhois*; and to limit the genus to those tumours or excrescences about the verge of the anus, which, under every view of the disease, form its prominent character.

These enlargements commonly, and perhaps in every instance, derive their existence from a turgid and varicose state of the anal or hemorrhoidal veins; for, in their simplest forms, piles consist of nothing more than varices of these veins, covered with a slight thickening of the inner membrane of the rectum, as Dr. Baillie has sufficiently shown in his illustrative plates. —(*Morbid Anat.*, pl. v., fig. 2, 3, p. 78.)

[When piles are discriminated from mere swellings of the veins, termed *hemorrhoidal varices*, to which the practice of excision is dangerous, they are first seen in the form of small fleshy tubercles, generally of a brownish or pale red colour, and either situated within the anus, or descending from the rectum. They have rather a solid and spongy feel, and when cut into, present a surface more or less compact and bloody, from which blood oozes, leaving the texture pale and more relaxed. When they are more external, they are paler, and generally also more elastic and transparent; and they appear and disappear more quickly than the former. Piles very often contain a central cavity, filled with fluid or coagulated blood, and lined with either a smooth or granulated cyst. By means of fine anatomical injections, a few minute vessels may be demonstrated, through which the blood exudes into the central cavity, but no direct connexion exists with any of the larger vessels. The cavity usually does not exceed the size of a pea; but it is sometimes large enough to hold several drachms of blood. More generally, however, there is no regular cyst, but the substance of the tumour is infiltrated with blood, which eventually becomes dark and coagulated. Common piles subside and return at uncertain periods, and they become larger and firmer, in proportion to the frequency of the attack. Often, however, after some discharge of blood, they collapse, their cavity seems to be obliterated (See *Sir A. Cooper's Lectures*, vol. ii., p. 336), and they leave merely pendulous flaps, formed of stretched skin. But when they have been strangulated for some time by the pressure of the sphincter, repeatedly gorged with fluids, or been of very long standing, they acquire more solidity, and become permanent, varying but little in size, and forming a source of almost constant pain, from protrusion, inflammation, or ulceration; or, by occasioning a distressing prolapsus of the anus. This permanent state of the tumours is referred by Mr. Calvert partly to the development of the capillary vessels, by which the interstices are gradually obliterated, and partly to the coagulation and organization of the effused blood. Hence the production of condylomatous tumours, and what are termed hemorrhoidal excrescences, all of which are solid, and can only be removed by the knife or ligature. With respect to this description the editor begs to observe, that all the several forms of piles are generally conceived, and probably with correctness, to be originally mere swellings of veins, whatever may be the solidity they afterward acquire, or the seemingly small or indirect communication of their cavity with the venous trunks.]

From local irritation, produced by indurated and retained feces, or purgative stimulants, and especially aloetic purgatives; or from an undue determination of the blood to the hemorrhoidal vessels, by excessive walking or riding; or their turgescence, arising from enlargement of the liver or adjoining viscera; from the pressure of the gravid uterus on the pelvic veins; from the irritation of stone in the bladder, and often from a peculiarity of the constitution itself; the extremities of the hemorrhoidal veins are apt to become varicose, and swell into tumours; frequently accompanied with inflammatory action in the surrounding mucous follicles; the swellings enlarge gradually into caruncular excrescences, pea-sized, fig-sized, or of various other figures, sprouting about the verge of the anus, within or without; and are often so painful as to prevent either walking or sitting. Some-

times the caruncles thus produced are hard, florid, incompressible, without discharge, and intolerably sore to the touch. Sometimes irritation induces a secretion of whitish mucus from the neighbouring glands. Sometimes the hemorrhoidal vessels themselves, that form or supply the sprouting tumours, are so distended as to burst and bleed freely. And occasionally the inflammatory action gives rise to the formation of caruncles of different shapes and sizes, sometimes spreading about the perinæum, but mostly existing within the verge of the anus. Whence we obtain four distinct varieties, as follow :—

α Cœca.	Blind piles.
β Mucosa.	White piles.
γ Cruenta.	Bleeding piles.
δ Caruncularis.	Caruncular piles.

We have just observed, that piles in their simplest state consist of nothing more than varicose tumours of the anal veins, covered with a slight thickening of the inner membrane of the rectum : and I have pointed out a variety of causes predisposing to such tumours. The trivial term *cæca*, or *blind*, though not peculiarly expressive of the idea intended to be conveyed, has been applied for ages to the first example before us, which is void of every kind of discharge, whether mucous or sanguineous, and has no *eyelet* or aperture through which such discharge may flow, and carry off the accumulation. Mariscal tumours, Mr. Copeland conceives, are most common in persons who possess a very strong action of the sphincter ani, and are hence habitually predisposed to a spasmodic stricture of the rectum. In such persons he supposes, that on every expulsion of the feces, the internal membrane of the rectum, together with the vessels it contains, is protruded, and caught or detained, and some of its veins strangled by the forcible constriction of the muscle. That this is a frequent cause of piles I have no doubt, though, from their occurring in such numerous instances in persons of lax fibres and debilitated habits, it appears to me to operate less frequently than is suspected by Mr. Copeland.

Mariscal excrescences are likely to be the hardest, the sorest, and the most florid of the whole, when the result of such a cause. Where they proceed from a mere relaxation of the vascular system, or a diseased state of the larger abdominal viscera, they will sometimes acquire a considerable bulk without being highly painful; but in this case, they are usually soft and compressible.

It will be better and more compendious to take a survey of the other varieties, before we proceed to the curative intention.

In some persons, the mucous follicles of the interior membrane of the rectum are far more easily excited to secretion than in others ; as we see in many individuals the mucous membrane of the nostrils pour fourth a readier and more abundant defluxion. It is in this state that the tumours assume the name of WHITE or MUCOUS PILES ; and as the excretories thus easily evacuate themselves, there is much less soreness and irritation, and the tumours or tubercles are comparatively pale as well as moist ; and, though often not admitting of so rapid a cure as some of the other varieties, are considerably less distressing.

It often happens that, from distention, the walls of the anal varices give way, and form BLEEDING PILES. Yet it does not always follow that blood is hereby discharged, or the tumours are diminished. For it occasionally occurs that the surrounding membrane does not give way at the same time, and consequently that the extravasated blood is accumulated in the contiguous cellular substance, and the tumours, instead of diminishing, increase from the size of a pea to that of a pullet's egg, block up the entire passage of the rectum, and are a source of very great evil. If, however, this take place at some distance above the sphincter ani, where the parts yield more easily, the pain may not be excessive ; but if these enlarged tumours be seated on the sphincter, or within the range of its contractile influence, the torment induced is often intolerable.

From this difference of seat, piles from of old have been denominated external and internal; and it was imagined by Dr. Stahl and his disciples, that the former were produced by a gorged state of branches from the vena cava, and the latter from a like congestion in branches of the vena portarum. No benefit, however, can possibly result from such a distinction ; nor is the distinction itself founded in fact : for all the arteries and veins that appertain to the lower part of the rectum arise so diversely, and anastomose so frequently, that an affection of one must be communicated to another, and the general result be participated by the whole.

In most cases, however, in which the varicose vessels burst, the distended and attenuated membrane that surrounds them bursts at the same time, and the blood flows externally. The hemorrhage is in some cases very considerable: and as this variety, more than any of the others, is apt to run into a habit, the constitution occasionally becomes greatly debilitated, and often dropsical ; and the hemorrhage has, in a few instances, been so profuse as to endanger life. When, moreover, a hemorrhodial habit is once established, the flux, even if it do not undermine the health by its quantity, often becomes periodical, enters into the chain of constitutional actions, and becomes a regular condition of the corporeal weal ; so that its suppression is attended with serious mischief.

It often happens, and especially during the first variety, which evinces the highest degree of inflammation, that an effusion of coagulable lymph takes place around the mariscal varix, which terminates in vascularity, and the production of a fleshy substance, that still continues even after the overloaded vessels have recovered their proper diameter and tone. It is these CARUNCLES, which are rather the sequels of piles than piles themselves, that constitute the fourth variety. They are of different shapes and sizes, bulbous, soft, and compressible, red or reddish ;

and not unfrequently the base shrivels into a narrow neck, while the body of the caruncle enlarges and elongates so as to assume a polypous appearance.

Caruncles, not very unlike, are frequently found sprouting from the cuticle or cutis that surrounds the anus, often assuming the appearance and having much of the nature of warts; solitary or clustering, with a broad or narrow base; and which are sometimes regarded as piles, but are altogether of a different origin.

In attempting a cure of this complaint, our first attention must be directed to the cause, as far as we can ascertain it. If the bowels be habitually costive, gentle laxatives should be employed daily; and where the complaint has been induced by excessive walking or other muscular exertion, quiet and a recumbent position must be sedulously enjoined. The laxatives in either case may be the cassia or senna confection; oil of castor, where it will sit easy on the stomach, with the addition of a little spirit, which is its best corrective; and sulphur. Sulphur has long been regarded as a specific for piles; but I do not know that it possesses any other virtue than that of being a mild aperient. It seems, however, to be an aperient peculiarly calculated to act upon the large intestines; since, being soluble with difficulty in animal fluids, it dissolves slowly, and does not spend itself till it has descended to a considerable depth in the alvine canal.

Dr. Cullen was in the habit of employing in this complaint the balsam of copayva. After observing that, like turpentine, it proves aperient, he proceeds as follows:—"Whether a certain effect of balsam of copayva is to be imputed to this operation, I cannot determine; but must observe, that I have learned from an empirical practitioner, that it gives relief in hemorrhoidal affections, and I have frequently employed it with success."—(*Mat. Med.*, part ii., cap. v., p. 190.) His dose was from twenty to forty drops, properly mixed with powdered sugar, once or twice a day.

I have tried this medicine often, and when it has appeared useful, it has been chiefly in the case of mucous piles; I am hence induced to ascribe its salutary effect rather to the common principle, on which it is well known to act in irritations of mucous membranes generally, than to its laxative power.

Where the pain and tension are very distressing, relaxant cataplasms and fomentations are generally advisable. The common bread poultice, with a solution of opium, is one of the best.

The butter of chocolate may be advantageously employed for the same purpose, either as a most mild emollient ointment, in the form of a suppository, with a small portion of spermaceti, or as an exquisitely bland bougie with a nucleus of cotton.

If we can clearly refer the disease to a gorged or obstructed state of the liver, or any other abdominal viscus, the purgatives we employ may be of a more active kind, and a free use of the lancet should precede them. And if the piles should depend upon a strong entonic action of the sphincter ani, bleeding from the arm will also be highly useful; but the local application of leeches will answer better.

In every variety, indeed, in which there is much heat, hardness, and irritation, leeches will be found an important remedy; and when these symptoms are hereby removed or mitigated, we should have recourse to local tonics and astringents. The patient may sit frequently in a bidet of cold water, or apply cataplasms of cold water and crumb of bread; or, if the tumours be seated above the sphincter, use injections of cold water. With the water we may often advantageously intermix the earthy or metallic astringents, as alum, sulphate of zinc, or the superacetate of lead. Where the turbercles are not very sore, they will often yield to a layer of gypsum, or, what is better, fullers' earth, which, however, should be rubbed into as soft a paste as possible. This is a remedy which has been long employed on the continent (*Eph. Nat. Cur.*, Dec. iii., Ann. iii., obs. 162); and I have sometimes prescribed it with singular success, and have known piles, when softish and compressible, removed by it in a single night.

Several vegetable astringents are well entitled to our attention for the same purpose; and especially the powder or extract of catechu, which I have known to be serviceable to external tubercles in the form of ointment, and to internal ones in the form of an injection. And Dr. Cullen speaks with equal favour of finely pounded oak-galls, in cases where the disease is not connected with the general habit.—(*Mat. Med.*, part ii., chap. i., p. 46.) A mild solution of the nitrate of silver will, however, often be preferable to any other astringent.

If these should fail, the pressure of bougies should be had recourse to, and especially in piles supposed to be produced by a constitutional entonic constriction of the sphincter muscle; for, in this case, it will have a tendency to remedy both the cause and effect at the same time. Suppositories and bougies for this purpose are of long standing and high recommendation. With a view of uniting the two advantages of pressure and cold, they were formerly recommended to be made of slices of any of the cucurbitaceous fruits, as cucumber, gourd, or melon (*Morgagni, De Sed. et Caus. Morb.*, Ep. xxxii., art. 12; *Lange, Miscell. Verit.*, p. 104); but none of these are sufficiently stiff to obtain an adequate expansile force; and hence the large rectum bougies in common use have been advised. I have sometimes seen them made of very finely polished ivory, of a conic shape, about the length of the forefinger, with a ringlet at the base; and the exquisite smoothness and equality of pressure they possess peculiarly fit them for the purpose. Mr. Bell proposes a bougie or tent formed of a silver tube, wrapped round with soft linen, or a piece of sheep's gut tied at one end, and then pushed to a sufficient height into the rectum, and forcibly distended with water.—(*Surgery*, vol. ii., chap. xvi., p. 259.)

Occasionally nature has effected a cure; and the effused substance has been absorbed without any artificial means whatever (*Marigues*,

Journ. de Méd., tom. xxxii.); but more generally neglect produces the most lamentable consequences, and especially fistulous ulcers of very difficult removal; which have sometimes indeed, as Mr. Gooch has sufficiently exemplified, wormed a sinuous path, and opened into the vagina.—(*Cases*, &c., p. 249.) And hence, if none of the preceding means should be found to answer, and especially if the tubercles be extremely painful and distressing, they should be removed with all expedition by ligature, caustic, or the knife. Of these, the use of caustic is by far the most unadvisable, whether actual or potential. Of the other two methods, it is not easy to say which is the preferable; and hence each has been in favour with different practitioners. The chief disadvantage of the ligature is, that, by tying up the surrounding membrane of the intestine along with the immediate substance of the tumour, a very high degree of sympathetic irritation, and even inflammation, has at times been excited over the whole range of the intestinal canal, and even the perinæum, and to a degree that has in some instances proved fatal: the ligature appearing to act, as M. Petit observes (*Œuvres Posthumes*, tom. ii.), in the same manner as the pressure of the tendinous rings of the abdominal muscles in cases of strangulated hernia; and producing the same effects of incessant hiccough, vomiting, abdominal inflammation, and gangrene. This, however, rarely occurs except when the ligature is applied round several tumours at the same time, or during their inflamed state; for if only one be operated upon at once, and the rest in succession, the irritation has not been generally extensive, or of longer duration than two or three days. And perhaps even this might be avoided, by denuding the tumour of its external covering, as M. Petit has proposed.

The chief difficulty that attends the operation of excision is a very troublesome, obstinate, and debilitating hemorrhage, which is apt to follow, and which many surgeons have found very hard to restrain; chiefly, perhaps, because the veins of the abdominal viscera are destitute of valves. Sir Astley Cooper has once or twice found it prove fatal; and hence, though in his earlier years an advocate for excision, he afterward gave a preference to the ligature.—(*Lectures*, &c., vol. ii., p. 342, 8vo., 1825.) Excision, therefore, is chiefly calculated for the caruncular variety, and in such cases is far preferable to the ligature; but where we have reason to believe that the varicose vessels are of a large diameter, the knife should not be had recourse to. [Mr. Calvert, whose observations on piles are judicious, makes a practical distinction between the firmer swellings, whose cavity or cells have but a small or indirect communication with the large veins, and other tumours, which he calls hemorrhoidal varices, and consist entirely of dilated veins. The latter are the cases to which the practice is inapplicable. Hemorrhoidal varices are generally of a dark or bluish colour, soft and elastic to the touch, resembling in this respect ripe grapes; and, when compressed by the finger, they are evidently diminished, but return to their former state as soon as the pressure is removed. Their shape is also very different from that of other hemorrhoidal tumours; being broader at the base, rounder, and sometimes distributed in irregular clusters, like similar affections of the venæ saphenæ. Tumours may also be presumed to be of this nature, when they can be traced from the anus far up the rectum.—(See *Calvert on Hemorrhoids*, &c., 8vo., Lond., 1824.)] Cutaneous excrescences about the anus, erroneously denominated piles by the vulgar, may be taken off with a knife or a pair of scissors, in any number, or to any extent, without reserve.

SPECIES V.

PROCTICA EXANIA.

FALLING DOWN OF THE FUNDAMENT.

INVERSION AND PROLAPSE OF THE VILLOUS TUNIC OF THE RECTUM, FROM ENTONY OR RELAXATION OF THE SPHINCTER.

This is a very common and a very troublesome disease: but it is capable of a perfect cure in most cases, and of great relief perhaps in all. There are two varieties of it, proceeding from the two opposite causes of atony and entony, and which demand a very different mode of treatment.

α Atonica.	Relaxed Exania.
β Spasmodica.	Spasmodic Exania.

Where the action of the sphincter is feeble, it collapses readily, and often imperfectly; and the part of the rectum that always descends towards the verge of the anus upon a protrusion of the feces, instead of being retracted with elasticity, remains exposed, or ascends imperfectly. Yet there is little pain or tumour, and reduction is easy. Under such circumstances, exania, or a prolapse of the inner membrane of the rectum, will often occur on the slightest dejective effort: but if, at the same time, the rectum be labouring under any morbid irritability from the stimulus of scybalous feces, ascarides, or purgatives, the protrusion will be greatly exacerbated, a much larger portion of the gut will be exposed, and its retrocession will be more difficult.* Sometimes, indeed, the portion exposed has been very considerable; for Morgagni relates a case, in which the valvulæ of the colon were hereby brought into view (*De Sed.*, &c., xxxiii., lxv. 6); and Hagen (In *Schroeder Verm. Schr.*, band i., p. 609, 1778) another, in which there was a prolapse of the entire colon itself.

Common, however, as is the disease before us from local or general debility, it is perhaps still more frequent from that habitual or accidental excess of contractile action in the sphincter of the anus.* If the tumour remain down, it

* The correctness of this explanation may be doubted: the case here described, probably, does not arise from excessive action of the sphincter, but rather from a bad habit of sitting long at stool, and from the protracted efforts of straining, in which many muscles tend to propel the rectum and its contents downwards, the sphincter and cellular connexions of the gut becoming thereby

becomes large, irritable, and painful; and, if assistance be not obtained soon, a violent and serious inflammation will be sure to supervene.

In the atonic prolapse, but little aid is necessary, in ordinary cases, to return the protruded part. A simple pressure of the hand against the denuded part of the intestines, or sitting upon a plain and hard seat, will ordinarily be sufficient; and, if not, an introduction of the forefinger up the anus will always succeed. Hence patients, labouring under this variety, commonly return the gut themselves after evacuation; and in many instances it will ascend of its own accord.

The chief difficulty is in effecting a cure; which can only be accomplished in two ways: by invigorating and bracing the loose and relaxed membrane, or giving it an adhesion to the subjacent cellular substance from which it is detached.

The first may sometimes be accomplished by local tonics and astringents; as cold water dashed against the buttocks, injections of cold water, solutions of alum, or sulphate of zinc, or an infusion of catechu, or gallnuts.

The second can only be accomplished by artificially exciting a slight continuous inflammation in the cellular substance, by slipping off a small piece of the protruded membrane, as recommended by Mr. Hey, or passing a ligature through a small portion of it, and letting it remain after the return of the membrane, till the inflammatory action has commenced; by which means a radical cure is often obtained, in the same manner as a like cure is effected in scrotal dropsy, by hooking forwards and cutting off a small piece of the tunica vaginalis after evacuating the water. Mr. Copeland has employed this method in various instances, and with all desirable success.

Where there is a prolapse of the upper part of the rectum, or of the colon, the disease is of a different kind; for, in this case, the entire parietes descend, and the upper part is invaginated in the lower, as in an intro-susception of the smaller intestines; but with less mischief in the present instance, as there is more space for play, and as the intestinal canal evinces less sensibility, and consequently admits of harsher treatment, in its progress towards its lower extremity. In this case, the whole we can aim at is to strengthen the fibres of the relaxed bowel, and restore them to a healthy elasticity by the use of tonic and astringent injections.

In entonic or spasmodic exania, it will be often necessary to apply leeches, and to bleed pretty freely, before a reduction can be obtained. After which, as this is chiefly a result of spasmodic stricture, or depends upon like causes, the mode of treatment already recommended for the one will be the best plan to be pursued for the other.

This complaint is also found occasionally as an effect in lithiasis, proctica marisca, helminthia podicis, scirrhus of the prostate gland, fistula ani, and other affections of the uterus, vagina, bladder, and neighbouring organs.

ORDER II.

SPLANCHNICA.

DISEASES AFFECTING THE COLLATITIOUS VISCERA.

DISQUIET OR DISEASED ACTION IN THE ORGANS AUXILIARY TO THE DIGESTIVE PROCESS, WITHOUT PRIMARY INFLAMMATION.

THE order of diseases upon which we now enter, is in the present classification denominated SPLANCHNICA (ΣΠΛΑΓΧΝΙΚΑ), as primarily affecting, and being seated in, the viscera that are directly adjuvant to the function of digestion. The term SPLANCHNICA is thus reduced to its more limited and emphatic sense: for, in a loose and broader signification, it imports, like its Latin synonyme *viscera*, all the larger bowels or internal organs, to whatever cavity they appertain, and consequently includes the brain: but in its stricter and more exact meaning, it was formerly confined to those of the lower and upper belly, comprising what we colloquially call the ENTRAILS; and more especially those which were consulted by the aruspices, and constituted the chief parts of the sacrifice: in which sense it is mostly employed by Homer, and the Greek tragedians.

The organs, therefore, to which the term is here intended to be applied (for the alvine canal forms the subject of the first order), are the liver, spleen, pancreas, mesentery, and omentum; and, as in the physiological proem to the class before us, we took a general survey of the structure of these organs; and, so far as we are acquainted with them, of the parts they respectively fulfil in accomplishing the economy of digestion; we shall proceed, without farther delay, to a consideration of the diseases which belong to them under the proposed arrangement.

The order embraces four genera:

I. Icterus.	Yellow Jaundice.
II. Melæna.	Black Jaundice.
III. Chololithus.	Gall Stone.
IV. Parabysma.	Visceral Turgescence.

Of these, several comprise numerous species, which will be noticed in their respective places.

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in time so weakened, that a prolapsus ani ensues. In the production of the first variety described by the author, spasm of muscles has a share, particularly when there is irritation about the rectum from piles, or other cause; though, of course, the repeated protrusions will naturally, at last, weaken the sphincter.—ED.

GENUS I.
ICTERUS.
YELLOW JAUNDICE.

YELLOWNESS OF THE EYES AND SKIN; WHITE FECES; URINE SAFFRON-COLOURED, AND COMMUNICATING A SAFFRON DIE; THE COURSE OF THE BILE OBSTRUCTED.

This disorder was by the Greeks denominated ICTERUS (ΙΚΤΕΡΟΣ) as above, and by the Romans, as Celsus particularly notices, Morbus arquatus, or Morbus regius: but on what account either of these names has been given to it, we have no satisfactory information. Arquus means a rainbow, which requires more explanation than has hitherto been given; and the meaning of regius, as expounded by Celsus, will, I apprehend, content very few. "Its cure," says he, "is to be attempted by exertions of every kind, luso, joco, ludis, lascivia, per quæ mens exhilaretur; OB QUÆ REGIUS MORBUS DICTUS VIDETUR" (*Medicin.*, lib. iii., sect. xxiv.): —"by play, jests, sports, and dalliance, on which account it seems to be called Morbus regius, or the royal disease." It has also been named by many writers, ancient as well as modern, *Aurigo*, evidently from its golden hue. But, of the origin or meaning of icterus, we are left altogether in the dark by the critics and lexicographers. It appears to the present author, however, probable, if he may venture upon a subject which has hitherto been tried in vain, that all these terms are expressive of a common idea; and, though not derived from a common root, are employed as equivalents to express its meaning. Icterus (*Ἴκτερος*), as it seems to him, is the Hebrew term יכתר with a formative ו producing יכתר or "icter," and importing, as a verb, "to surround, circumfuse, encompass;" and, as a noun, "a royal crown, or golden diadem." Icterus was a term also given to the golden thrush or golden pheasant, on account of its golden plumage: and hence the bird was fabled to be connected with the disease; and it was believed, according to Pliny, that if a person labouring under the jaundice should look at the pheasant, the bird would die, and the patient recover. Regius, arquatus, aurigo, are not indeed univocals, but very clearly equivalents, and equally import gold, golden crown, golden bow, or circumfusion; the colour of the disease, and its encompassing the body. There are other diseases however that produce or are accompanied with a yellow tinge of the surface, as well as jaundice; as aurigo (Class vi., Ord. iii., Gen. x., Spe. iv.), and sometimes porphyra or scurvy. Frank mentions a case of the latter, in which there was an intense yellowness of the whole skin, chiefly proceeding from broad maculæ, even to the palms of the hands and soles of the feet. —(*De Cur. Hom. Morb. Epit.*, tom. vi., lib. 6.) But in all these cases, the albuginea is little or not at all affected, and the urine does not communicate the saffron die of jaundice.

There is, however, a far more important inquiry immediately connected with this subject, which I am afraid will be still less easily settled. We are sufficiently acquainted with the seat of jaundice, which is the liver, and of its proximate cause, which consists in an impeded flow of the bile; but who shall explain to us the real use of the bile, or even the final use of the liver that secretes it! Considering the large size of the liver in all animals that possess it, and, at the same time, how generally it is possessed, being to all red-blooded animals as common as the heart itself, there can be no doubt that it is of great importance in the animal economy, notwithstanding our uncertainty of the part it performs.

Even below the rank of red-blooded animals, we often discover it, and of great extent; as in the snail, oyster, and muscle; and frequently, too, where we cannot trace an organ answerable in structure and appearance to the liver, we are obliged to admit the existence of an organ that supplies its place; for there are many insects, as the larvæ of the *cynips querci*, or gall-fly, and that of the *curculio nucis*, or nut-weevil, that secrete bile in such quantity as to tinge with a brownish yellow the tender branch, nut, or other substance in which they find a habitation, and to give it a taste as bitter as ox-gall.

The direct and obvious office of the liver is the secretion of bile, which, in most animals, is suffered to accumulate in a pear-shaped reservoir, adhering to its concave surface, and denominated a gall-bladder. Yet, in many animals, even of different classes, we perceive no such reservoir, as the elephant, rhinoceros, stag, camel, goat, horse, trichecus, porpoise, rat, ostrich, and parrot: while we do not know of a reptile that is destitute of it. Upon the whole, however, it may be observed, that a gall-bladder is common to all carnivorous animals possessing a liver, and that it seems to be only wanting in those that feed on vegetables alone. Yet, while we see the distinction, we are ignorant of its cause, and incapable of applying it. In the human subject, it has sometimes also been wanting,* of which Dr. Cholmeley gives an example (*Med. Trans.*, vol. vi., art. 4): but such a deficiency has mostly occurred in infants who have perished soon after birth; before which period, as there is no transit of feces through the intestinal canal, and perhaps no peristaltic action, it does not appear to be necessary. Perhaps, indeed, antecedently to birth, there is no bile secreted. In the case related by Dr. Cholmeley, although the whole of the bile, as fast as it was secreted, seems to have been carried back into the system, the sallowness of the skin is not noticed to have occurred till the day after birth; from which time the child exhibited a deeper and deeper hue, till it died of convulsions at the end of five weeks.

[The want of a gall-bladder does not always dangerously impair the health (*Meckel's Anat.*, vol. iii., p. 312); and an example in which a person, with such malformation, reached the adult state, has been lately recorded.—(*Mém. de Méd. Mil.*, tom. xx., p. 406.) Cats bear the removal of the gall-bladder without fatal con-

* Olivier, note sur l'atrophie de la vésicule biliaire, in Archiv. Gén. de Méd., tom. v., p. 196

sequences.—(*Sir E. Home, Phil. Trans.*, 1813, part ii.)]

It was stated in the physiological proem, that one supposed use of the bile is, to maintain the peristaltic action of the bowels. Yet Sir Everard Home (*Phil. Trans.*, 1813, pp. 156, 157) has given an example of a child that fed heartily, seemed to digest its food well, and had regular stools, and was nevertheless without a gall-bladder, or even a duct of any kind leading from the liver to the duodenum.*

There are also a few other circumstances relating to the bile, that yet stand in need of explanation. The hepatic bile, or that secreted into the hepatic duct, is mild and sweet; the bile found in the gall-bladder is pungent and bitter; whence we might infer, that it is the gall-bladder that secretes the bitter principle. Yet, in children, the gall-bladder bile is as sweet as that of the hepatic duct; and in various insects, as we have already seen, a bile powerfully bitter is secreted without either gall-bladder or liver. Who shall develop the cause of these discrepances? Who shall unfold to us the use of the bitter principle of the bile, or explain why it is necessary to the animal economy in an adult state, and not necessary in a state of infancy?

Yet, whatever be the use of the bile, or the office of the liver, we know that the general symptoms of jaundice depend upon an obstruction to the flow of the bile into the alvine canal, and its retrograde passage into the blood. [Thus in animals jaundice may be produced by applying a ligature to the ductus choledochus; and, in the human subject, dissection has frequently proved its origin from the direct or indirect pressure of various swellings and indurations, either of the pancreas, stomach, spleen, omentum, and other organs, against the biliary ducts. The jaundice occasionally arising in pregnancy, is sometimes ascribed to the pressure of the gravid uterus on the same canal, and sometimes to a plethoric state of the system, and of the liver in particular, in consequence of the suppression of the menses, which last opinion was espoused by Sauvages, Portal, and Powell. Dr. Elliotson has frequently seen jaundice in pregnancy; not however as the result of pregnancy, but of inflammation of the liver, and which subsided under the treatment for common inflammation, while the pregnancy went on.—(*Med. Gazette for* 1832–3, p. 488.) Whatever will produce hepatitis, or great congestion of the liver, will bring on jaundice.] It has been supposed, indeed, that the bile might, after entering into the intestines, be absorbed and carried into the blood, and by this means produce a jaundice, and a jaundiced hue, without any obstruction to its flow into the intestinal channel. But, in this case, it seems impossible that the stools should not be tinged with a yellow, instead of presenting a white hue, which is one of the common characters of the disease.* In order to constitute jaundice, there must generally therefore be some obstruction to the passage of the bile through its proper ducts into the intestinal canal. And this obstruction may proceed from five sources, each of which may be accompanied with peculiar symptoms, and consequently furnish us with the five following species:—

1. Icterus Cholæus. Biliary Jaundice.
2. —— Chololithicus. Gall-stone Jaundice.
3. —— Spasmodicus. Spasmodic Jaundice
4. —— Hepaticus. Hepatic Jaundice.
5. —— Infantum. Jaundice of Infants.

The disease is also found symptomatically in pregnancy, colic, and fevers of various kinds; especially *epanetus icterodes*, or yellow fever.† [It is generally a sporadical complaint, but instances of its being epidemic, particularly at the termination of campaigns, in wet autumnal seasons, and also of its being endemic, are recorded.‡ The disease appears to have been

* The daily escape of a considerable quantity of bile through a fistulous opening in the parietes of the abdomen, has occurred without serious impairment of the appetite, the digestion, or the health in general. This is a curious fact, and deserves to be well considered in every physiological view of the hepatic system. Dr. Abercrombie visited, along with Mr. Lizars, a man, about fifty, who had had a biliary fistula for nearly four years. The complaint began with pain in the region of the liver, accompanied by vomiting and jaundice. After these symptoms had continued about three weeks, a tumour formed in the region of the gall-bladder, which was opened, and discharged much fluid of a mixed green and yellow colour, and some small biliary calculi. This opening closed, but another soon took place, which has continued to discharge ever since. The discharge varies in quantity, but is often so profuse as in a very short time to wet the patient's clothes as far as his knee, and in the night, to soak through his bed. Mr. Lizars at one time collected, in the course of fifteen or twenty minutes, about four ounces of a fluid, which on chymical examination exhibited all the properties of pure bile The *man has every appearance of good health*, and except the fistulous opening, there is no appearance of disease in the region of the liver. His appetite and digestion are good, and the evacuations of a natural appearance.—See Abercrombie on Diseases of the Stomach, &c., p. 395. —Ed.

* Exceptions are occasionally met with, in which the feces are not white. Bile passes into the intestines; but so much is secreted, that all does not escape, and a portion goes into the circulation. It is conceivable then, that jaundice may arise from an excess of bile. This view, however, is sometimes regarded as hypothetical: thus, Dr. Abercrombie does not place confidence in morbid viscidity of the bile, spasm of the ducts, overflow of the bile, and what has been termed bilious congestion, as the causes of jaundice.—See Pathol. and Pract. Researches on Diseases of the Stomach, &c., p. 394, ed. 2.

† The colour of the skin in yellow fever is not always regarded as the effect of jaundice. "The yellowness in this case is not universal; it occurs particularly about the neck; and it appears rather to arise from a disordered state of the blood, or an altered condition of the blood as to some of its constituents, exactly as we see it in bruises."—See Elliotson in Med. Gaz. for 1832–3, p. 487.

‡ See Monro on the Health of Soldiers, 2 vols. 8vo., 1780.—Pringle on Diseases of the Army, Edin., 1810.—Alibert, Nosologie Naturelle, &c., 4to., Paris, 1817, &c.

epidemic at Cronstadt in 1784 and 1785, and at Geneva in 1814. In the latter city, it occurred after the hot weather of summer, being in some cases combined with a bilious fever; in others, not associated with any other manifest disorder. —(*Dict. des Sc. Méd.*, tom. xxiii., p. 414.) Persons who have been in warm climates are more predisposed to the disease than others.]

SPECIES I.
ICTERUS CHOLÆUS.
BILIARY JAUNDICE.

THE COURSE OF THE BILE OBSTRUCTED; GENERAL LANGUOR, NAUSEA, DYSPEPSY, AND OCCASIONAL PAIN OR UNEASINESS AT THE STOMACH.

The specific term cholæus (χολαῖος) is here restored from the Greek writers, among whom it has been common from the time of Hippocrates.

Dr. Cullen has not noticed this species: but it occurs in Bonet, Amatus Lusitanus, Forestus, Sauvages, and most of the later writers. It is easy, indeed, to conceive that bile may become inspissated from various causes, and particularly from an absorption of its aqueous or thinner parts, by the lymphatics of the ducts themselves, or of the gall-bladder; from an augmented secretion of the albumen, or, as Berzelius considers it, the mucus of the gall-bladder dissolved in the bile; and from too viscid a texture of the bile, in its secretion in the liver. And, in effect, there are few observant practitioners but must have remarked, that the evacuations, whether by the mouth or the anus, when the obstruction is just removed, consist at times of nearly pure bile, peculiarly tenacious and high-coloured.

[After the bile is secreted, if the hepatic or the common duct be obstructed, so that the passage of this fluid into the duodenum be prevented, it regurgitates into the liver, and is taken up by the absorbent vessels, and carried into the mass of the circulating blood,* in the serum of which it becomes dissolved, and thus gives it its own yellow colour. The blood, thus tinged, carries the die with it to every part of the body, and hence the general hue of jaundice is produced. It would seem, however, that the bile, in a liver, distended from obstruction of the ducts, is not only taken up by the absorbents, but it is also forced into the mouths of the hepatic veins. In dissections, Dr. Saunders and Dr. Powell both notice bile in the thoracic duct, and the first of these physicians found the serum of the hepatic veins in a dog, in which jaundice had been a short time before produced by a ligature on the common biliary duct, evidently more loaded with the colouring part of the bile, than the serum in other veins.* When the bile reaches the circulation, the intensity of tinge which different parts receive, will be in proportion to their vascularity, and the quantity of colouring matter thus carried to them; or to the natural hue of the part being more or less calculated to show it, as in the eye, and white of the nails.]

This species is found most generally in the autumn. In many instances, it commences slowly and insidiously; there is felt a general restlessness, diminution of appetite, disturbed sleep at night, and disinclination for exertion of any kind: the urine is of a deep yellow, and deposites, perhaps, a pitchy sediment; the bowels grow sluggish, the dejections are clay-coloured or whitish, and have not the usual feculent smell. In some examples, however, the bowels are loose. The eyes and surface of the body look yellower than usual, and there is a very troublesome itching of the skin. In this species, however, there is little or no pain in the right hypochondrium, and little or no sickness at the stomach, though a frequent sense of nausea.

[In all cases of jaundice, except such as are very suddenly produced by the bites of venomous animals, and other particular causes, the yellowness commonly first shows itself about the inner angles of the eyes, the white of which is tarnished in a very early stage; but the whole cornea soon becomes manifestly yellow. On the temples, light yellow patches are next seen, which daily assume a deeper and deeper tinge. Similar yellow discolorations then appear on the face, neck, and breast, and all at length spread and unite, so as to cause a universal tinge. Yellow semicircles at the roots of the nails make their appearance very early. It is a curious circumstance, however, in the history of jaundice, that the yellow die of the skin should generally first show itself on the upper parts of the body, which are likewise the first to resume their natural colour.

* The actual presence of bile in the blood of jaundiced persons is denied by M. Deyeux (Considérations Chimiques et Médicales sur le Sang des Ictériques, 4to., Paris, 1809); and doubted even by M. Thenard. On the contrary, the researches of M. Clarion (Journ. de Méd. an 13), Orfila (Elém. de Chim. Méd.), Saunders, Alibert (Nosol. Naturelle, 1817), and others, tend to prove the correctness of the belief, as ancient as Hippocrates, that the bile passes into the circulation. John Hunter supposed that the mixture of bile with the blood would make it coagulate; but it is known that a quantity sufficient to give a yellow tinge to the serum, does not have the effect in question. We know that the serous secretions assume a remarkable yellowness. If a person labouring under jaundice is blistered, the fluid from the blister is yellow, and the serous fluids within the body are of the same colour. Dr. Cheyne related to Dr. Marsh the case of a lady, affected with jaundice, whose linen was rendered quite yellow by the exhalation from her skin.—Ed.

* See Saunders on the Structure, Economy, and Diseases of the Liver; Powell's Obs. on the Bile, p. 56; Bateman in Rees's Cyclopædia, art. Jaundice. Where the presence of the yellow matter of the bile in most of the solids and fluids constitutes this disease, we are not to imagine that an impediment to the transmission of bile through the biliary ducts into the duodenum always exists. In numerous persons, who died of or with jaundice, those ducts have been found perfectly free.—Andral, Anat. Pathol., tom. ii., p. 616, and Clinique Médicale.

The tongue, palate, and teeth, have a yellow coating, which cannot be washed away. Whatever the patient puts into his mouth frequently has a bitter taste; and, indeed, the bitterness in the mouth is very annoying, even not at mealtimes. A partiality to acids and sourish food is also generally experienced.

In this affection, the pulse is ordinarily feeble. In the beginning, however, particularly if there be any pain in the hypochondrium, it is hard, and even frequent and full. But after the pain subsides, the pulse has been known to sink to only thirty strokes in a minute, some examples of which are reported by M. Andrée.—(See *Dict. des Sci. Med.*, tom. xiii., p. 408.)

In an early stage of the disease, free vomiting is of essential service. During this action, the diaphragm and abdominal muscles contract concurrently; and the whole of the viscera of the abdomen is forcibly pressed upon. Such a pressure must necessarily, therefore, affect the gall-bladder and biliary ducts, and oblige them to pour out their contents very freely; nor is there a more powerful means in our possession of unloading the liver of any viscous or stagnant fluid, or of restoring and invigorating its circulation. For this purpose, the antimonial emetics are preferable to those of ipecacuanha. They are less readily rejected, and excite a stronger stimulus from the first; and hence the vomitings they produce will continue for a longer period of time. To these should succeed a brisk purgative or two, with a copious use of diluting, sub-acid drinks, which, in ordinary cases, will easily remove every symptom. But if the disorder, from the obscurity of its march, be not soon suspected, the impeded passages will become more obstinately obstructed, the gall-bladder and bile-ducts will be distended; there will be a general feeling of fulness in the right side, with great irritation and fever; which last will often continue for a week or a fortnight after the obstructing cause has been removed.

Where the substance of the liver has been free, and the ducts alone obstructed, the quantity of bile that has accumulated in the gall-bladder has sometimes been enormous. In one instance, which terminated fatally, this reservoir was found, after death, to be so considerably dilated, as to be loaded with not less than two Scotch pints, or eight pounds, of this fluid.—(*Edin. Medical Essays*, vol. ii., art. xxx.) [Whether this case ought to be received as a confirmation of the statements of Galen, Darwin, and Powell, that jaundice is sometimes the result of paralysis of the gall-bladder, from immoderate distention of it, is a question not easily solved.] There is often a paresis or hebetude of action in the bile-ducts themselves; and where we have reason to suspect this, it will be most effectually relieved by the blue-pill, or small doses of calomel, or Plummer's pill, which is better than either, continued for two or three weeks at a time * If the liver partake of this torpitude, and no acute symptoms occur, the disease is apt to run into the fourth species, and must be treated accordingly.

* In the treatment of jaundice, Dr. Elliotson very judiciously recommends us first to consider whether any inflammation exist; whether the case is one of hepatitis; and, if it be, then it is to be treated on principles applicable to the latter disease. He coincides with many other practitioners in considering mercurial purgatives more efficacious in jaundice than any others.—(See Med. Gaz. for 1832–3, p. 489.) When jaundice appears to be connected with any affection of the liver of an inflammatory character, Dr. Abercrombie, after subduing the activity of the symptoms by local and general bleeding, blistering, low regimen, and free and continued purging, recommends mercurial friction, and friction with iodine. —Pathol. and Pract. Researches on the Diseases of the Stomach, &c., p. 399.—ED

SPECIES II.
ICTERUS CHOLOLITHICUS.
GALL-STONE JAUNDICE.

THE COURSE OF BILE OBSTRUCTED BY BILIOUS CONCRETIONS IN THE DUCTS, WHICH ARE AT LENGTH PROTRUDED AND DISCHARGED WITH THE FECES; FREQUENT RETCHING; ACUTE PAIN IN THE HYPOGASTRIC REGION, INCREASED UPON EATING.

THIS species is the *icterus calculosus* of most of the nosologists. It is so closely connected with the genus CHOLOLITHUS, OR GALL-STONE, forming the third in the present order, in its general origin, symptoms, and mode of treatment, that the reader may be referred for almost all these to the latter. Yet it is necessary to give the two affections distinct places: for the yellow die of the skin and urine, which forms a pathognomonic symptom in icterus, occurs often, as we have already seen, without chololithus, even in its passing species and acute state, and very generally in its quiescent state. The liver itself is, in many cases, sound (*Heberden, Med. Trans.*, vol. ii., p. 124); but it is often connected with a morbid condition of this organ, and proceeds, perhaps, in some instances, from a morbid secretion of bile, by which it becomes more disposed to crystallize. Dissection has shown, that the seat of obstruction is most frequently in the cystic duct; next in the ductus choledochus; and then in the hepatic.* The rest will be explained under the genus CHOLOLITHUS.

* Jaundice takes place from the presence of a gall-stone in the biliary ducts, when the calculus is a considerable time in passing, so as to produce an obstruction of some continuance in the duct: when it passes in a shorter time, though the symptoms may be equally severe, no jaundice follows. —(See Abercrombie on Diseases of the Stomach, the Intestinal Canal, the Liver, &c., p. 394, ed. 2.) "It has been disputed," says this able physician, "whether biliary calculi are ever formed in the substance of the liver, or in the gall-bladder only. But Morgagni mentions several instances in which they were found in the liver, and even of great size; and, therefore, there is no doubt of another point, which has been disputed, namely, that they may produce jaundice by sticking in the hepatic duct."—Op. cit., p. 396.—ED

SPECIES III.
ICTERUS SPASMODICUS.
SPASMODIC JAUNDICE.

THE COURSE OF THE BILE OBSTRUCTED BY A SPASMODIC CONSTRICTION IN THE COURSE OF THE BILE-DUCTS; THE DISEASE COMMONLY PRECEDED BY ACRIMONIOUS INGESTA, HYSTERIA, OR SOME VIOLENT PASSION OF THE MIND; AND SPONTANEOUSLY SUBSIDING WITHIN A FEW DAYS AFTER THESE ARE REMOVED.

The general symptoms of this affection are those of the preceding species, or of *chololithus means*, which so closely agree with the preceding; but the causes and mode of treatment are different; and it is necessary to attend to their specific signs, in order that they may be distinguished.

Spasmodic jaundice occurs for the most part in those of irritable habits, or whose liver, from a long residence in hot climates, from an undue indulgence in spirituous potations, or high-seasoned dishes, or from any other cause, is in a state of chronic irritability. So far as I have observed, it occurs more frequently in women than in men, probably from their passing a more sedentary life, and chiefly after menstruation has ceased, and the general form assumes a more corpulent shape.

There is also very commonly, in those who are subject to it, a sallowness of the skin, indicative of irritability and increased action of the liver, and of a larger regurgitation of bile into the bloodvessels than is necessary for the purpose of health. Dr. Heberden has observed that the liver is sometimes perfectly sound; and there is no doubt that this is a fact; for the irritability may originate in, and be confined to, the ducts; but it more generally commences in the liver itself, and is hence extended to the ducts, which, from their structure, are far more irritable, as well as more sensible, than the parenchyma, or general substance of the liver, and consequently far more susceptible of pain and spasmodic contraction.

[Spasm of the common duct is particularly mentioned by Dr. Cullen among the causes of jaundice, and Dr. Powell deems the fact well established, although it has often been denied. Andral enumerates four principal causes of the complete or incomplete, temporary or permanent, obstruction of the biliary passages, viz., the lodgment of a foreign body in them; their compression by membranous adhesions, or some kind of tumour; their spasmodic contraction; and the thickening of their mucous membrane from inflammation.—(*Arch. Gén. de Méd.*, tom. vi., p. 16.) Jourdan and Breschet, however, express their suspicions, that the latter state also prevails in every instance reported to be spasmodic.—(*Meckel's Anatomy*, vol. iii., p. 313, note.) Jaundice frequently accompanies spasmodic diseases. Thus it is said by Sydenham to come on during hysterics, a circumstance which the editor has never seen, and which is denied by Dr. Heberden. According to Dr. Saunders (p. 235), anger not only augments the quantity of bile, but likewise vitiates it. Hence, flowing into the duodenum in large quantities, and regurgitating into the stomach, it produces the same effects as an emetic; and hence, probably, the term *choleric*, as applied to passionate people. If the ductus communis should not transmit it as fast as it is secreted, and the gall-bladder be already full, then it will return towards the liver, and, by entering the bloodvessels, produce jaundice. Dr. Bateman regarded this as the most probable explanation of the influence of the passions in producing a temporary jaundice, and of course he did not put much faith in the doctrine of spasm.* Among the less common causes of jaundice, a thickening of the biliary ducts is mentioned by Morgagni, who records a case of a total obliteration of the common duct.—(Op. cit., Epist. 37, art. 10.)]

The primary cause of this disease we cannot always trace; but it is easily reproduced in those who are subject to it, by flatulent, acrimonious, or indigestible food, or by violent mental emotion. It is often also reproduced, or even primarily excited, by cold in the feet, drinking cold water when the body is greatly heated, and a transfer of atonic gout from the extremities to the stomach, or any part of the intestinal canal. We have hence a clear proof of the strong sympathetic connexion which exists between the liver and various parts of the body. [The jaundice sometimes produced by corporeal suffering, irritation in the alimentary canal, and the bites of venomous animals, is referred by Hoffmann, Mead, and Bosquillon, to the spasmodic species.] An affection of the brain will also often produce jaundice (*Marsh, in Dublin Reports*, vol. iii.); and hence a frequent exciting cause is a sudden and violent burst of the depressing passions, as terror, jealousy, and despondency. It is, indeed, most probable, that the torpitude induced directly in the organ of the liver, from the exhausting heat of tropical climates, is also greatly augmented by the operation of the same cause on the skin, and the sympathy of the liver with this organ.

The disease is ushered in by a sense of fulness at the stomach, accompanied with great languor and nausea; a violent pain at the pit of the stomach soon succeeds, with an almost incessant sickness, and an utter inability of retaining either food or medicine of any kind. The pain grows intolerable, and shoots towards the left shoulder, or spreads round the loins,

* Rees's Cyclopædia, art. Jaundice. Dr. Abercrombie doubts the truth of the doctrine of spasm of the biliary ducts as a cause of icterus (on Dis. of the Stomach, pp. 394 and 400); and Dr. Burder is of opinion that we have no evidence of its existence.—(Cyclop. of Pract. Med., art. Jaundice, note, p. 5.) The two following cases are quoted by Dr. Abercrombie, as proving clearly the origin of jaundice from passions of the mind: a woman, mentioned by Hoffman, was affected with jaundice every time that her mind was agitated; and a medical gentleman, spoken of by Mr. Cooke (on Derangements of the Digestive Organs), became jaundiced almost invariably when he had a dangerous case under his care.—Ed.

and girds them as with a cord. The epigastric region is greatly distended, and cannot endure the pressure of the hand; while the pulse exhibits little variation.

The bowels are for the most part costive, and moved with difficulty. [The stools are scanty, of a grayish, or clay colour, and, as long as the urine is of a deep yellow or saffron colour, voided with difficulty. But, when this secretion becomes paler, they assume their natural yellowness again, are more copious, and the patient begins once more to be conscious of the sensation preceding or accompanying their natural expulsion; a sensation, that is lost while the bile continues to tinge the urine in a considerable degree. It should be understood, however, that costiveness does not always precede or attend the first symptoms of jaundice; but as Monro, Pringle, and Powell attest, there is sometimes a considerable looseness, with grayish stools of a faint, or rather sour smell. At first the urine is yellow and quite limpid; but it afterward becomes frothy, saffron-coloured, reddish, and very thick; sometimes almost black, depositing a sediment like brick-dust, or dark blood. In proportion as the yellowness of the skin fades, the urine loses its saffron colour, and becomes clear again.] This colour shows itself the sooner in proportion to the violence of the other symptoms, and especially of the retching; and the surface of the body, and especially the fine sclerotic coat of the eye, assume the same livery. And if the disease become chronic, the yellow die is not confined to the skin, or even to the fluids, but pervades every part of the body, the most compact as well as the most porous; so that the pericardeum, the heart, the peritoneum, the meninges, the substance of the brain, the cartilages, and even the bones, are clothed with the common colour. Stoll (*Rat. Med.*, part iii., p. 386, *et passim*), Lieutaud (*Hist. Anat.*, p. 190), Bartholin (*Epist.* iii., p. 419), and Morgagni (Op. cit., epist. xxxvii., art. 7), give various examples of this; though the last observes, that a yellow tinge of the brain is a rare occurrence.

One of the latest fluids that becomes tinctured is the milk in icteric wet-nurses; probably in consequence of its rapid passage and elaboration from the fluids introduced into the stomach. Dr. Heberden has remarked, that, in wet-nurses, the milk is never tainted with the bile either in taste or colour; but this assertion is too general, and at variance with the observations of other pathologists. Reidlin lays down the fact more correctly, in affirming that all the humours are *sometimes* coloured yellow.* And hence, indeed, the only reason we can assign for the bilious and bitter taste that is often present in the stomach, insomuch that every thing the patient eats or drinks partakes of this quality: while the common bile-duct is locked firm, the intestines are without bile, and the stools are whitish or clay-coloured. The fact is, that the whole mass of blood is so impregnated with bile, that the saliva, and all the other lubricating secretions of the mouth, fauces, and œsophagus, and probably the gastric and pancreatic juices, are loaded with the same material, so that the sense of taste cannot be otherwise than affected.

The jaundiced have, from a very early period, been said to see all objects of a yellow hue, as they appear to us when looking through a yellow object-glass; from which we may judge, that the humours of the eye, like the other fluids of the body, are also tinged, as Celsus observes (*Medicin.*, lib. iii., sect. xxiv.), with the resorbed bile, and communicate the tinge to the picture thrown upon the retina. Lucretius, so far as I know, is the earliest writer, of those that have descended to our own day, who has made this remark, which he introduces (*De Rer. Nat.*, iv., 333) as illustrative of another subject, and appeals to as a familiar fact:—

"Lurida præterea fiunt, quæquomque tuentur
Arquatei; quia luroris de corpore eorum
Semina multa fluunt, simulacris obvia rerum;
Multaque sunt oculis in eorum denique mixta,
Quæ contage sua palloribus omnia pingunt.

"The jaundiced, thus, see all things round them
In yellow; every object as it flows [clad
Meeting new tides of yellow, from their forms
Thrown forth incessant; and the lurid eye,
Deep, too, imbued with its contagious hue,
Painting each image that its orb assails."

Dr. Heberden, however, affirms, that all the jaundiced patients he has at any time attended have contradicted this opinion, with the exception of two females, whose testimony he is disposed to hold lightly; and Professor Frank is decidedly of opinion, that no such affection takes place. Yet from a single case in my own person, produced, when a student, by long-continued pressure of the epigastrium against the edge of a table in copying my shorthand minutes of medical lectures, I can confirm the general opinion: for, the first suspicion I entertained of my being affected with jaundice, was from the yellow tinge with which every object around me appeared to be arrayed. To produce this effect, however, it is necessary, as already observed, that the crystalline lens, and, perhaps, all the humours of the eye, should be tinged, and acquire the yellow hue of the sclerotic coat. This certainly does not at all times take place; and where the humours are unaffected, objects must certainly be seen in their proper colours; but where they are thus tinctured, and form a yellow transparent medium, it seems difficult to conceive how a picture, transmitted through them, can avoid catching their own die; and hence we may see why some persons, labouring under the jaundice, perceive objects coloured with yellow, and others in their proper hues.

[The statement here made by the author, and which agrees with what Morgagni has said

* Lin. Med., 1697, Febr., Obs. 7. In examining the body of a woman who died in the Lock Hospital of Dublin, from protracted disease, connected with jaundice, Dr. Morris found the mammæ full; and, by moderate pressure, several ounces of a yellow tenacious fluid, having all the visible properties of pure bile, were discharged from them. —ED.

relative to this curious point,* seems to be confirmed. Dr. James noticed this disorder of vision in two old patients affected with jaundice. Hoffmann records two similar cases; and Alibert met with an additional example in a girl who was in the Hôpital St. Louis. Dr. Pemberton met with two instances, and in both the jaundice was not very intense. Dr. Elliotson has also had patients similarly affected; and he remarked that, in these examples, there was either a fulness of the vessels round the cornea, or a degree of inflammation of the conjunction present.—(*Med. Gaz.* for 1832–3, p. 487.) The rarity of this affection of vision in jaundice corresponds to, and depends upon, the rarity of the extension of the yellowness to the humours of the eye.]

I have said that this species of jaundice, and the remark may be applied to all the species except the last, sometimes assumes a chronic form. In this case the distressing symptoms of severe spasmodic pains, intumescence, and sickness subside; but the bile does not flow freely into its proper channel, and continues in a greater or less degree to be absorbed and carried into the circulation. The cause of this seems to be an insensibility and paresis approaching almost to a paralysis in the bilious tubes, and a chronic irritability in the hepatic absorbents. Under these circumstances, moreover, the bile that thus tardily finds its way into the duodenum must be grosser and more viscous than in a healthy state; and hence another cause of retardation and irregular supply. There is also a change in the colour, as well as in the consistency, of the bile, frequently to be met with in the chronic state of the disease; which may sometimes be the result of a morbid secretion, but is perhaps more generally that of a chymical decomposition, from the joint influence of decay and animal heat. And under these circumstances, the bile has at different times and in different persons been found acid, acrid, saltish, insipid, whitish, black, green, eruginous, and versicoloured. It has been found as dense and dark as elder-rob (*Eph. Nat. Cur.*, dec. iii., ann. iv., obs. 86); as tenacious and limpid as the white of eggs (*Stoerck, Ann. Med.*, i., 124); and as crowded and granular as the spawn of frogs.—(*Eph. Nat. Cur.*, dec. ii., ann. ix., obs. 9.)

In this chronic form, jaundice has sometimes run on for a long period of time, occasionally for a twelvemonth. It has alternated itself with intermittents; proved a salutary crisis to fevers; or has itself been carried off by exanthems of the more violent kind; and especially by miliary and scarlet fever. The general functions, when it has assumed this form, and the constitution has become habituated to it, are sometimes so little disturbed, that we see people of the middling and lower ranks of life who cannot afford to keep at home, and who would certainly be the worse for it if they could, going about the streets with the jaundice hue covering their hands and faces, and not prevented from engaging in any of the ordinary concerns of life in which no great degree of exertion is required.*

In the treatment of this species, emetics and cathartics, so highly beneficial in *icterus cholæus*, are of doubtful advantage. When, however, the bowels are particularly costive, or there is reason to suspect the lodgment of a small calculus, or of any inspissated bile in the biliary duct, purgatives are indicated in the first case; and both purgatives and emetics in the last. But in all other examples they must add to the disease by increasing the irritation, and should give way to bloodletting, if the patient be in vigorous health, succeeded by opiates, the warm-bath, or warm and anodyne fomentations applied to the epigastrium.† The opiate should be given in pills, for the stomach will often reject liquids of every kind. Two or three grains of the extract of opium may be tried at first, and if this be insufficient, the same or even a larger dose should be repeated half an hour afterward, and continued till the pain abates. Blistering the seat of pain has been advised by many; and I have often tried it, but without any decided effect. If useful at all, it is rather in preventing a return of the paroxysm, than in shortening or mitigating it when present; and will hence be most advantageously resorted to in the interval.

The ointment of tartarized antimony, so warmly recommended by Dr. Jenner, has a much fairer chance of success; and, in the author's practice, has at times effected a cure where other means had been found useless. A portion of the ointment, equal in size to a hazelnut, should be rubbed every night into the epigastric region till the ordinary eruption appears.

The general soreness upon pressure, and the excitement of the hepatic absorbents, as already observed, continue very frequently for several weeks after the spasm itself has subsided; and

* Aliquando tamen, sed rarissime, fieri potest, ut flava in hoc morbo objecta appareant, nimirum si cornea tunica bile tota saturata sit, neque tum solum, quod et Mercurialis concedit, verum etiam si quando oculorum humores summa flavedine infecti sunt.

* All men of experience will agree with Dr. Abercrombie on this part of the subject, namely, that long-continued jaundice generally depends either upon chronic disease of the liver, or upon other diseases of neighbouring organs, compressing the biliary duct. Yet, as this judicious and correct observer has remarked, chronic disease of the liver of most extraordinary extent is sometimes unattended with jaundice.—See Abercrombie on Diseases of the Stomach, &c., p. 401.—Ed.

† When jaundice is characterized more by spasmodic pain than inflammation, Dr. Elliotson deems the hot-bath and opium the best means of relief. But if the pulse be quick and strong, he recommends bleeding, as the most effectual antispasmodic that can be employed. He prefers also combining the opium with a full dose of calomel, which will prevent costiveness, and produce a free discharge from the alimentary canal. A poultice over the part, he says, is very useful.—(Lect. at London University, pub. in Med. Gaz. for 1832–3, p. 489.) Dr. Good has this eminent physician with him as a believer in the reality of spasmodic icterus.—Ed.

consequently there will be great languor, indisposition to labour, and a tawny skin.

For all this, a generous diet, cheerful company, and moderate exercise, and especially riding on horseback, go very far towards effecting a cure; and perhaps farther than any course of medicine whatever. The bowels, however, must be kept open with warm aperients, and the stomach and abdominal viscera invigorated by bitter tonics.

The dandelion (*leontodon taraxacum*, Linn.) has been highly extolled by many writers of established reputation in all obstructions of the liver, and, indeed, in obstructions generally; and has been used in its roots, stalks, and leaves. All these abound with a milky, bitterish juice, which was at first supposed to be saponaceous, and hence warmly commended as a resolvent by Boerhaave. Bergius, Murray, and Dr. Pemberton have since contributed to support this character, and they are consequently in daily use even in the present day.* The plant has no doubt, therefore, deobstruent virtues; but it has not fallen to my lot, though I have many times given it a fair trial, to add my suffrage in its favour. Its most obvious character is that of increasing the flow of urine.

Soap and alkalis, however, seem to have much better pretensions to favour; and have been still more widely employed in this disease, and pretty extensively regarded as general, and hence as hepatic solvents. Yet that they do not act as solvents in hepatic cases, is clear from a striking instance related by Dr. Heberden, who tells us that he once attended a person who, for a stone in the urinary bladder, had been in the habit of swallowing an ounce of soap every day for seven years. His body was opened after his death; and, notwithstanding such an extraordinary quantity of soap had been taken, a great number of stones were found in the gall-bladder, without the slightest marks of having been operated upon by any decomposing power.—(*Med. Trans.*, vol. ii., p. 65.)

Soap, however, and other alkaline preparations, may perhaps be useful in another respect: I mean, in becoming a substitute for the deficient bile, and cleansing the bowels by their possessing something of the same chymical properties. Yet too much stress must not be laid even upon this virtue; for large quantities of acids, as lemon-juice, have at times been taken with so much apparent benefit, as to gain, also, the credit of a cure. There is one drawback against whatever may be the remedial powers either of soap or of the alkalis; and that is, their frequent and easy decomposition in the stomach, in consequence of its containing at all times some quantity, and occasionally a very large proportion, of acidity. We may often, perhaps, introduce so much of these medicines as shall be more than sufficient to neutralize the acid; but where a large quantity is wanted for this purpose, it is better to employ the alkali alone than combined with oil, as less troublesome to the stomach. And where this is done, the best, because the most manageable preparation of the alkalis, will be that which is the purest and most concentrated, as the liquor potassæ; nor does it appear that the other alkalis would answer better if we had forms for elaborating them in the same manner. The Cheltenham spring has unquestionably been serviceable in the relics or sequelæ of the disease, and where exercise and a tonic plan are decidedly indicated. But where we have reason to believe that the bile is secreted in a depraved condition, and particularly where the disease is connected with a morbid state of the liver, the Bath waters, used both internally and externally at the same time, will be found more beneficial than those of Cheltenham.

Another remedy to be spoken of, which of late years has excited great attention, is the diluted aqua regia bath, invented by the late Dr. Scott. For nearly thirty years he was in the habit of using this preparation, and had tried it in almost every variety of strength, and almost every variety of proportion, which the two acids that enter into the composition may be made to bear to each other. He commenced his experiments in India, where, on account of the greater degree of torpitude the liver is apt to acquire than in more temperate climates, he was in the habit of forming his bath stronger, and making it deeper than he found it proper to do in our own country; and where, nearly thirty years ago, he plunged the Duke of Wellington into one up to his chin, for a severe hepatic affection he was then labouring under, and thus restored him to health in a short time.

In England it was not often that he found it necessary to raise the bath much above the knees, and frequently contented himself with a mere foot-bath or common wash-hand basin alone. In both which cases, however, the attendants on the patient should sponge him at the same time with the diluted aqua regia, over the limbs, and occasionally over the body.

The aqua regia should be compounded of three parts in measure of muriatic acid and two of nitric acid; and in preparing them for use, a pint of the combined acid is to be mixed with the same measure of water. This constitutes the diluted acid, or diluted aqua regia. The acid bath is to consist of three ounces of this diluted acid to every gallon of water. It should, however, be observed, by those who are inclined to form this mixture extemporaneously at their own houses, that if either of the acids be poured immediately on the other, a large volume of very offensive gas will be disengaged; on which account, it will be better to pour them separately and slowly on their proper measure of water.

If the acids be of adequate strength, the mixture subdiluted for bathing will, to the taste, have the sourness of weak vinegar, and perhaps prick the skin slightly, and excite a peculiar rash, if very delicate, but rarely otherwise, after

* The reputation of the leontodon is sustained by the experience of some modern American physicians. The occasional use of the blue-pill, followed by mild aperients, with the alkalis and the infusion of dandelion, has been found efficacious in some long-continued cases of the nature described in the text.—D.

it has been applied to the surface for half an hour. But since these acids vary much in their degree of concentration, as distilled by different chymists, there will be some variation in their power. The strength of the bath, however, should not be much greater at any time than the proportion here laid down; for otherwise it may excite a troublesome rash, and give a yellow hue to the nails and skin of the feet, or whatever other part is exposed to its action. A narrow tub for a knee-bath, just wide enough to hold the feet and reach the knees, should contain three gallons of the prepared bath liquor, and consequently about nine ounces in measure of the diluted aqua regia. For a foot-bath, half a gallon may be sufficient, and a common wash-hand basin may be employed as a vessel for the purpose. The feet should remain in the bath for twenty minutes or half an hour; and the legs, thighs, and abdomen be, in the mean time, frequently sponged with the same. In the winter the water may be used warm; but this is not necessary in the summer. The bath may be employed at first daily for a fortnight or three weeks, and afterward every other day, or only twice a week.

Dr. Scott affirms that he has employed this process with decided advantage in almost all cases dependant on a morbid secretion of bile; whether the secretion be superabundant, defective, or depraved. He finds it often, within a few hours of the first bathing, increase the flow of bile, and meliorate its character; and in consequence hereof, excite an expulsion of dark-coloured feces, bright-coloured bile, or bile of a brown, green, or black colour, like tar mixed with oil. He has told me also, that when employed in the midst of a paroxysm of severe pain from spasm of the biliary ducts, or the passing of a gall-stone, he has often known it operate like a charm, and produce almost immediate ease.—(See also *Med. Chir. Trans.*, vol. viii.)

From the rapidity, therefore, with which it acts in some cases, he is inclined to think that it operates, not by the absorbents, but by the nerves; and has made various experiments to show that it is the chlorine of the muriatic acid alone, by the present process decomposed and set at liberty, that produces the benefit of the bath. To prove this, he employed a bath of water saturated with chlorine, obtained from the muriatic acid by mixing it in a retort with the black oxyde of manganese; and the same salutary effects followed: and he has given this saturated solution in doses of half or three quarters of an ounce, three or four times a day, mixed with the same quantity of spearmint, or any other distilled water, with evident benefit, in very numerous hepatic cases of great obstinacy.

This account may be rather overcharged, from the ardent mind of its intelligent inventor: but the process is worth following up, and varying in other proportions, as well as employing in other families of diseases. My own use of it is at present too limited to speak with decision; yet, so far as I have tried it, it has certainly appeared to me to allay irritation and produce a tonic effect. In two or three instances, the advantage has been decisive; and patients who had hitherto been seldom two months without a severe return of the complaint, have entirely escaped, and apparently lost the morbid predisposition. In a few other cases, it has completely failed.

Mr. Wallace has been employing chlorine in the form of gas, obtained by a mixture of muriatic acid with the black oxyde of manganese, as well as diluted with aqueous vapour; and he regards the peculiar eruption brought out by it as a favourable sign.*

SPECIES IV.
ICTERUS HEPATICUS.
HEPATIC JAUNDICE.

THE COURSE OF THE BILE OBSTRUCTED BY A DERANGEMENT OF THE LIVER FROM SCIRRHOUS OR OTHER INDURATIONS; OCCASIONAL RETCHINGS AND DYSPEPSY: LITTLE OR NO PAIN IN THE RIGHT HYPOCHONDRIUM.

In the preceding species, the appendages to the liver, as the gall-bladder or gall-ducts, are the chief seat of disease, at least in its commencement. In the species before us, the disease is chiefly seated in the liver itself. It may be a result of the preceding species when they have assumed a chronic form; but, as the liver itself is often affected from the first, it is entitled to be treated of as a distinct species. The course of the bile, indeed, is evidently obstructed, but rather in its secretion, or separation from the substance of the liver, than in its transmission by the biliary tubes.

This species is noticed by Boerhaave, by Sauvages, and by Dr. Cullen in his Synopsis, though he has offered no remarks on it in his First Lines. In Boerhaave, however, it imports altogether a different disease, for it is jaundice produced by hepatitis,† or inflammation of the liver; and is hence a mere symptom, to be removed alone by a removal of the idiopathic complaint.

It is more accurately described by Richter, who confirms and illustrates the opinion of Vogel and Selle; both of whom suppose it to depend upon some peculiar irritation in the liver itself, or in the whole hepatic system; but an irritation not dependant upon or directly leading to inflammation. This irritation is of various kinds, and produces different effects, all of which become causes of obstruction to a free flow of the bile into its proper channels. One of the most common effects which operate in this manner, is a scirrhous enlargement of the whole, or of some particular part, of the liver. Another is an accumulation of calculous concretions in its substance; of which Richter gives a striking and complicated example in a person, who, after death, was found to be without a gall-bladder, and whose liver was filled with whitish calculi of different forms and

* Researches respecting the Medical Powers of Chlorine, London, 1822.

† Van. Swiet. Comment., Hepatitis et Icterus multiplex, tom. iii., § 914.

sizes, from that of a pea to that of a cherry. In this case there can be no question that the bile, whose colouring matter was diffused over the entire body, was not only formed in, but immediately absorbed from, the penicilli, or pores of the liver, in consequence of obstruction, without being collected into a reservoir.

This is the worst state in which jaundice can possibly make its appearance; for, though there is little or no pain, it shows disease in the structure of the liver, and is frequently a mark of a broken-up constitution. It is in fact found rarely in the young and vigorous; but almost always in those who have drunk hard, or lived hard, and especially have been exposed to much labour in hot climates, or have suffered under repeated attacks of quartans or other chronic intermittents.

The art of medicine can here do but little; and we have too often to witness the picture, drawn so feelingly of the Athenians during the plague:—

"—— Defessa jacebant
Corpora; mussabat tacito MEDICINA timore."*

It is only in an early stage of this disease, if happily we should be so soon consulted, that mercury has any chance of being successful; and it should be given rather as an alterant in small doses pertinaciously followed up, than in large proportions so as to excite a ptyalism; for we have here no strength to draw upon without injury. "I think," says Dr. Baillie, "that many practitioners of the present day have erred in administering mercury too long, and in too liberal doses. When mercury is carried beyond the point that is necessary, it often injures the constitution by weakening it, and rendering the nervous system very irritable." In some cases, small doses of calomel in combination with conium have been serviceable; and I have certainly found benefit from covering the hypochondriac region with a large plaster of the emplastrum hydrargyri cum ammoniaco. For the rest the patient must be put upon a general tonic plan: his diet should be generous without being highly stimulant; he should use such kind of exercise and in such proportion as best agrees with him; and the chalybeate springs, corrected as those of Cheltenham by neutral salts, form the best mineral invigorant to which he can have recourse. Possibly, in this malady also, the diluted aqua regia bath may be of service, employed as recommended under the last species.†

[In that state of the liver which produces jaundice towards the end of intermittent fevers, mercury is the best and only remedy; and calomel, in small doses, is the form under which it is the most efficient. When jaundice arises from congestion of the vessels of the liver, general bloodletting, or (if the patient's reduced state prohibit it) local bleeding, by the application of leeches, or cupping-glasses, to the right hypochondrium, will be proper; afterward, mercurial and iodine frictions are indicated.]

* Lucr. De Rer. Nat., vi., 1176.

† The Ballston and Saratoga mineral waters of the state of New-York have long been celebrated for their medical qualities, in several of the forms of jaundice or biliary obstruction, provided that general irritation and local inflammation be first judiciously remedied. Dr. Francis states that the sulphurous waters of the Avon spring, in Livingston county, New-York, are extremely useful in like cases, particularly where the tone of the digestive organs is impaired.—See his *Observations on the Mineral Waters of Avon*, in the *United States Med. and Surg. Journal*, No. 1, New-York, 1834. The waters of the yellow and white sulphur springs of Virginia are highly beneficial to invalids suffering from disorders of the digestive organs, chronic affections of the liver, the sequelæ of protracted intermittent fever, &c., and particularly in cases where mercury has been prescribed to excess for disorders of this character.—See *Bell on Baths and Mineral Waters*, pp. 436, 7.—D.

SPECIES V.

ICTERUS INFANTUM.

YELLOW GUM. JAUNDICE OF INFANTS.

THE COURSE OF THE BILE OBSTRUCTED BY VISCID MECONIUM; WITHOUT PAIN OR DYSPEPSY; EASILY REMOVED BY PURGATIVES.

THIS is the mildest form under which jaundice makes its appearance, and that which is carried off with least trouble. In ordinary cases, the only symptoms are the pathognomonic colour, and a degree of languor and drowsiness beyond what is common to infants on birth or shortly after.

A yellow hue, however, on the surface of infants, is not necessarily a symptom of jaundice, properly so called; for Lentin,* Cullen, and many others have well observed, that such a discoloration may also be the result of a peculiar yellowness of the serum of the blood, unconnected with bile (*Müller Origine Icteri*, Jen., 1788); analogous to the golden teint which we so frequently find diffusing itself over the surface of a contusion, when the finer and more limpid parts of the effused fluid have been carried off, and the colouring matter of the serum that still remains behind is hereby become more concentrated: as we shall have to notice more at large when treating of this affection under the name of *Aurigo*, constituting the fifth species of the genus EPICHROSIS.†

A dose of castor-oil, or any other active

* See Baume's Description de l'Ictere des nouveaux nés, &c., Nimes, 1788. Cull. Synops. Nosol., Gen. xci., 5, note.

† Cl. vi., Ord. iii., Gen. x. This view coincides with that taken by Andral: sometimes, he says, the icteric teint of the skin seems to be merely the result of an effusion of blood in its texture. Such appears especially to be the nature of the icterus of newborn infants, in whom the red hue of the skin may be seen gradually to change into a yellow teint, which, in its turn, is effaced, and replaced by the natural complexion. In the livers of such children, no constant lesion has been noticed that would account for the jaundice. This organ is said to have been sometimes seen gorged with blood; but it is quite as frequently found in this state, yet uncombined with icterus.—See Andral Anat. Pathol., tom. ii., p. 616.

purgative, will generally be sufficient to remove the obstruction, which in almost every instance proceeds from meconium more than ordinarily tenacious, and consequently will carry off the disease. But frequently the mouth of the ductus choledochus communis is so completely infarcted with this viscid matter, that purgatives are insufficient; and, in this case, an emetic should be given, and in a few days repeated, if necessary.

[Icterus being seldom a disease essentially mortal, and only having, in general, a fatal termination when combined with some serious organic disease, a distinction should be made between persons dying with jaundice, and those dying from it; a distinction first made by the celebrated M. Portal.

The bodies of icterical subjects usually present the same morbid colour which they exhibited in life. However, according to M. Portal, the intensity of the colour is sometimes diminished; while some bodies, which never showed any marks of jaundice previously to death, afterward turn of a very deep yellow. A tendency to anasarca is generally noticed, and, when incisions are made in the cellular membrane, a good deal of serum, which is of a more or less yellow hue, flows out. Whatever fluid is found in the ventricles of the brain, or in the chest, or abdomen, is likewise either of that colour, or reddish. In short, every texture, and even the most compact parts, present a yellow tinge; as the fat, the muscles (which with other organs are softened), the membranes, especially the serous ones; the lining of the arterial system; the tendons; the cartilages; the periosteum; and the very bones.

According to Morgagni, the lungs, heart, liver, spleen, and kidneys are softened, their texture containing a limpid yellow or reddish fluid. Most of the secretions partake of the same tinge.

No part, however, is more frequently affected in jaundiced subjects than the liver. Sometimes dissection demonstrates it to be either in a state of chronic inflammation,* or of preternatural volume or smallness, or converted into a fatty matter resembling tallow. Abscesses, ulceration, biliary concretions within its substance, and numerous close adhesions of it to the neighbouring parts, are likewise occasionally discovered after death.†

The state in which the gall-bladder is found is extremely diversified; very often it contains calculi, of which there may be only one or many. The single one is occasionally very large; the numerous ones, sometimes amounting to hundreds, are usually of diminutive size.* At the same time, the gall-bladder may contain no bile, or be prodigiously distended with it. Van Swieten speaks of a case, in which the gall-bladder reached from the liver to the crista of the ileum, and had more than a pint of bile in it. In some cases this fluid has been found viscid, almost black, and to contain gritty particles like sand. Dr. Bostock (*Bright's Reports*, 4to., Lond., 1827) has given the analysis of the fluid of the gall-bladder in a case of protracted jaundice, accompanying tubercular liver and dropsy. It had an orange colour and thin consistence; the animal matter in it was almost entirely albumen, with a little colouring matter different from that of the bile; and, in fact, it contained none of the usual biliary principles. In particular examples, the gall-bladder exhibits traces of the effects of inflammation, its coats being thickened and indurated. In one instance Bonnet (*De Ictero*, obs. 13) found excrescences within its cavity. Sometimes the gall-bladder is adherent to the neighbouring organs. In one patient who died with jaundice, the gall-bladder and cystic duct were altogether wanting.—(*Bourgeoise, De l'Ictère*, 4to., Paris, 1814.)

At various points of their course, the hepatic, cystic, and common biliary ducts frequently contain calculi of different sizes. When these concretions lodge either in the hepatic or common duct, they completely block it up; and hence it is often found considerably dilated above the obstruction, and containing a large quantity of bile; a circumstance that does not occur when the foreign body lodges in the cystic duct. Sometimes these several canals are so contracted, that a small probe cannot be introduced into them. Stoll met with the common duct in what he calls a cartilaginous state. Cabrolius has recorded a case of jaundice, in which there was a malformation of the common duct, its end towards the liver being very wide, and its communication with the bowels as minute as the extremity of a capillary vessel. The biliary ducts are often found compressed, and even more or less obliterated by various kinds of tumours formed in their vicinity. A most remarkable enlargement of the biliary ducts, in consequence of the pressure of a scirrhous pancreas on the common duct, is recorded by Mr Todd. After death, more than a quart of bile was found in them. The patient's face is represented to have been quite of an orange colour.

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* In jaundice, an inflammatory condition of the liver, in an obscure form, and often of small extent, may be suspected, when the disease is attended with pain, or tenderness in the region of the liver, though without fever, or any symptoms of active inflammation. The cases of more decided inflammation of the liver are alleged by Dr. Abercrombie to be attended with jaundice only when the inflammation is seated chiefly on or near its concave surface.—On Diseases of the Stomach, &c., p. 397.

† Dr. Stokes (*London Med. and Surg. Journal, March*, 1834) has seen an instance of jaundice arising from an aneurism of the hepatic artery, and also mentions the accumulation of fecal matter in the intestines as another cause of this complaint.—D.

* Calculi in the biliary ducts are not unfrequent causes of jaundice. "Their mere presence in the gall-bladder does not usually seem to produce either local or general inconvenience. Out of nineteen instances of biliary calculi, which occurred to Morgagni, besides four to Valsalva, in post-mortem examinations, not one had experienced jaundice."—Dr. Burder in Cyclop. of Pract. Med. Also Andral, Précis d'Anat. Pathol., tom. ii., p. 614.

—(*Dublin Hospital Reports*, vol. i., p. 325.) Dr. Elliotson states, that jaundice has arisen from the lodgment of a lumbricus in the duct of the liver (*Med. Gaz.* for 1832–3, p. 488); and, if this be the case, the opinion entertained by Andral and Cruveilhier, that worms only pass into this situation after the patient's decease, would appear to be incorrect.

When the common duct is rendered completely impervious by the lodgment of a calculus, and yet no jaundice takes place (a fact that has sometimes been noticed), the possibility of the existence of a second biliary duct has been suggested as an explanation of the circumstance. This preternatural arrangement is even admitted as possible, both by Morgagni and Portal, whose statements rest upon several cases in which it had been traced.

In some individuals who had been free drinkers, and died with jaundice, Stoll found the pylorus contracted, and a considerable portion of the stomach hard and almost cartilaginous.—(*Ratio Medendi*, pars tert.)

Sometimes the duodenum around the termination of the common duct has been found scirrhous and ulcerated. Dr. Marsh has related several instances, proving that jaundice may arise from an inflammatory state of the mucous membrane of the duodenum, whereby the mouth of the common duct was obstructed.—(*Dublin Hospital Reports*, vol. iii.)

Dissections prove that the compression of the biliary passages may be the result of disease and enlargement of the pancreas or spleen. A case of black jaundice is recorded by Zacutus Lusitanus, as having taken place in a person in whom the spleen was entirely wanting.

Sometimes the vena portæ has been observed to be very considerably enlarged, not merely in its trunk, but its ramifications. Any cause producing an obstruction of the circulation in this vessel may give rise to a species of jaundice very difficult of cure. In one subject which was opened by M. Honoré, the vena portæ was almost impervious in consequence of a tumour formed in its parietes. The patient had been afflicted with jaundice, and the stomach was cancerous.—(*Archiv. Gén. de Méd.*, Septembre, 1823.)

Among other causes of jaundice, dissection, as well as clinical experience proves, that collections of fluid in the abdomen, and abscesses of the liver, deserve to be particularly mentioned. In a woman whom the editor opened some time ago at the request of Dr. Pinckard, and whose gall-bladder had been nearly annihilated, there were abscesses occupying at least two thirds of the interior of the liver.

Jaundice is not an uncommon attendant also on organic diseases of the heart and lungs. When connected with those of the heart, it probably arises from the impeded return of the blood from the liver.—(*Abercrombie's Path. and Pract. Researches on Diseases of the Stomach*, &c., p. 399, ed. 2.)

Though the above account corresponds to what is commonly established by dissection, it is curious that sometimes all the foregoing morbid changes exist unaccompanied by the slightest degree of jaundice. And sometimes jaundice prevails in subjects in whom no organic disease whatever can be traced after death. Here Hoffmann and Morgagni have recourse to the suspicion of spasm of the biliary ducts, which are supposed to become relaxed after death.]

GENUS II.

MELÆNA.

MELENA.

THE COLOUR OF THE EYES AND SKIN YELLOW-GREEN, FULIGINOUS, LEADEN, OR LIVID; THE DEJECTIONS DARK-COLOURED, GRUMOUS, PITCHY, OR CONSISTING OF BLOOD; BILE AND THE INTESTINAL SECRETIONS MORE OR LESS ALTERED; ANXIETY; DEPRESSION OF SPIRITS.*

THIS is the Melæna, or Μελαινα νοῦσος of the Greeks: a name given to it by Hippocrates, who has been followed up by the Latin writers; among whom, with a mere translation of the term, it is called MORBUS NIGER, or the *Black-disease*, whence the name of BLACK-JAUNDICE.

The colour of the skin under this disease is always dark, but differs considerably in its shades, and even in its hue, in different individuals.—(Lib. xiii., obs. 23.) It sometimes approaches to a green; whence by Forestus, Razouz (*Tables Nosol.*, p. 129), and other writers, it has been called icteritia, or icterus *viridis*; on which account, it has of late been described under the name of *Green-Jaundice* by Dr. Baillie.

This versatility of colour is not to be wondered at; for I have already had occasion to observe, that the bile, under different states of a diseased liver or its appendages, exhibits very different appearances. In respect to consistency, it has sometimes been found watery (*Bianchi. Hist. Hep.*, p. 129; *Sebez. Exercit. Méd.*, p. 93), viscid, or flaky; in respect to colour, green (*Augen. Hor.*, tom. i., lib. xi., ap. 5), muddy, pale-white (*Eph. Nat. Cur.*, dec. i., ann. iv., obs. 194; Cent. iii., ix., app. 9), pitchy-black, eruginous (*Stoll, Rat. Med.*, part i., p. 292), and versicoloured; in respect to internal properties, insipid, salt, acid, or acrid and effervescent. In the disease before us it is always of a dark, and often of a black or pitchy hue. The stools are dark-coloured, and occasionally almost black; but the urine is sometimes pale, and generally clear.

Dr. Cullen seems to have been doubtful how to dispose of the genus MELÆNA. In his Synopsis, he has omitted it altogether: in his First Lines he has briefly noticed it, first under hæmatemesis, and again under diarrhœa, as though melæna were a variety of both these. But not satisfied with this distribution, he afterward introduced it into his "Catalogue of Diseases omitted, but which ought not to have been omitted" in his Nosology.

* The pale colour of the evacuations, formerly mentioned by Dr. Good in his definition, is here omitted, as inconsistent with the etymology of the term, and the opinions generally entertained of the nature of the disease.—ED.

With these occasional dejections of viscid and pitchy bile, and sometimes even without them, there is also frequently a discharge of dark, grumous, chocolate-coloured blood, accompanied with or preceded by a considerable pain in both hypochondria.

[Our author adopted Hoffmann's belief, that, in melæna, the liver and spleen were diseased, and their bloodvessels ruptured. Dissections do not prove the constancy of these circumstances. Dr. Cheyne has known two instances in which inky blood was vomited up, in consequence of long-continued sea-sickness, where no reason existed for suspecting tumour, or obstruction in any of the solid viscera of the abdomen; facts proving, in his opinion, that melæna may depend solely upon an excitement of the inner surface of the stomach. In the melæna cholæa, referred to a flow of ill-conditioned bile, though this fluid may really deviate very much from its healthy quality, this may depend entirely on some modification of secretion quite unconnected with structural disease. Thus, as Andral particularly states, no relation can be established between those alterations of the liver which dissection reveals, and the changes of the bile as detected by various tests. In the great number of diseased states of the liver, attended with change of structure, noticed by this author, the bile in the ducts and the gall-bladder was neither altered in its quantity or qualities. While, in other examples, where anatomy can discover no trace of any change in the parenchyma of the liver, the bile is either more abundant or more scanty than usual, or of a different quality from what it is in the healthy state. "I have," says he, "been surprised at the enormous quantities of bile distending the digestive tube, where scarcely a slight hyperemia existed in this canal, and the liver seemed in no way changed."—(*Andral, Précis d'Anat. Pathol.*, tom. ii., p. 611.) However, in cases of melæna cholæa, the liver may be diseased, and in the examples which have fallen under the editor's notice, it has generally been so; though it is proper to add, that the subjects of them had all been hard drinkers. In Dr. Markland's case, the liver was smaller than usual, and had a rough shrivelled appearance, with fissures one eighth of an inch in depth. It contained neither blood nor bile, and was of a natural consistence. The spleen contained little blood, but was of the natural size and appearance.—(See *Edin. Med. Journ.*, No. 79, p. 301.) In the third case, recorded by Portal (*Mém. sur la Nature, &c. de plusieurs Maladies*, tom. ii., Paris, 1808), no visceral disease was discovered after death; however, in two other examples described by him, the liver and spleen were diseased. They were also found diseased, as well as the stomach and small intestines, in a case published by Dr. Cheyne (*Dublin Hospital Reports*, vol. i., p. 263), who particularly mentions, that the vessels of the liver and spleen appeared to be destitute of blood. In a curious example of sixteen pounds of melæna found in the colon by Mr. Geoghegan, there were tubercles of the liver, and a stricture of the rectum.—(*Trans. of the Assoc. Physicians of Ireland*, vol. i., p. 197.)

The above symptoms have been accurately distinguished by Hippocrates, who in consequence hereof has noticed the two following species of the disease, which I have copied with little variation into our Nosological Synopsis, as forming the best arrangement, and giving the best view of melæna that I am acquainted with.

1. Melæna Cholæa. Black Jaundice. Green Jaundice.
2. ——— Cruenta. Black Vomit.*

SPECIES I.

MELÆNA CHOLÆA.

BLACK JAUNDICE. GREEN JAUNDICE.

OCCASIONAL DEJECTIONS OF DARK OR PITCHY BILE, INTERMIXED WITH THE FECES; OCCASIONAL VOMITINGS OF YELLOWISH-GREEN AND ACID COLLUVIES; GREAT LANGUOR, OFTEN VERTIGO; HYPOCHONDRIA FREE FROM PAIN, BUT TENDER UPON PRESSURE.

The liver is here generally diseased in its structure, and a morbid deep-coloured bile, fulvous, greenish, or fuliginous, is secerned instead of the natural excretion; the finer part of the fluid is first absorbed, and afterward the grosser; and what remains becomes still more viscid, more stagnant, and of a deeper hue.

"In the ordinary use of the term," observes Dr. Marcard of Hanover, "black jaundice means nothing more than yellow jaundice of a more than usually deep die; yet when the real disease exists to which this name ought to be

* Dr. Goldie has taken some pains to ascertain precisely what is said about Μελαινα νουσος in the treatise ascribed to Hippocrates, and he notices, as a remarkable circumstance, that the ancient description contains not a word respecting the black discharges by stool, which Sauvages and the moderns mention as characterizing melæna. Dr. Goldie states, that our author was evidently mistaken in supposing the two species, melæna cholæa and melæna cruenta, to have their derivation from Hippocrates; and he does not approve of Dr. Good's generic definition, inserted in the former editions, as seeming to rest wholly on the dark hue of the skin, and not that of the discharge from the alimentary canal. The editor certainly prefers Dr. Goldie's description, which runs thus:—"We mean, therefore, by melæna, the occurrence, *as a symptom*, in any disease, of very dark-coloured, grumous, pitchy, often highly fetid evacuations by stool, commonly joined with sanguineous vomiting; or, we use the word as *the name of a disease*, in which *such evacuations*, with or without vomiting of blood, *constitute the characteristic symptom*. In these two senses authors speak of *symptomatic* and *idiopathic* melæna; but even where the latter phrase is with most propriety employed, the hemorrhage may generally be traced to some constitutional disorder, or local organic disease, as its primary cause."—See Cyclop. of Pract. Med., art. MELÆNA.) One objection perhaps may be made to Dr. Goldie's definition, namely, that the "scharge, when blackish, generally has no smell, and has not that highly fetid quality which he has specified.—Ed.

limited, no practitioner, who closely examines the very dark colour of the skin and of the defluxions, and especially the danger that accompanies it, can avoid concluding that it has something peculiar in its nature, and cannot be merely an intense degree of yellow jaundice. It is highly probable," he continues, "that a part of the dark colour may depend upon the hue of the bile itself in a state of morbid secretion; but, along with this, there is also a very great structural decay in the biliary organs as well; a decay which gives the chief character to the disease; prevents so frequently all beneficial effects from the best medical treatment; and consequently renders the disease so often fatal."—(*Med. Versüche*, &c., Leipsic, 8vo., 1779.)

The green jaundice is sometimes to be found in young persons, but far oftener in the middle and more advanced periods of life. In men it occurs more frequently than in women, probably on account of the greater wear and tear of their constitution, as more exposed to all weathers and all climates; and appears to be less connected with intemperance than the yellow jaundice; and less disposed to terminate in abdominal dropsy.

In many instances, the hardness and enlargement of the liver extend through its entire structure, but are perhaps more frequently confined to some particular part of it. Upon pressing the region of the liver, the patient is commonly sensible of some degree of tenderness, but otherwise he feels no pain whatever, though he has the same distressing itching of the skin which I have already noticed in yellow jaundice; and sometimes a troublesome sensation of heat in the palms of the hands and soles of the feet.

The pulse, as observed by Dr. Baillie, continues "natural, both with respect to strength and frequency, unless some circumstance may have occurred to irritate the constitution for the time." In the more striking cases, however, that have occurred to myself, the pulse has been peculiarly slow, in some instances not amounting at any time to more than fifty beats in a minute, and occasionally to not more than thirty. The stools are generally pale; but, from some irregular excitement of the liver, appear sometimes tinged with bile of a peculiarly dark and pitchy hue; a part of which, from its overflow, rushes into the stomach, and is discharged by the mouth. The urine is deeply loaded with the same, and tinges the linen of a dark tawny hue; it flows freely, and sometimes deposites a pinky sediment.

The appetite varies, not only in different persons, but even in the same. Some patients eat with a pretty good habitual inclination. In others, the stomach is extremely capricious; at one time without any desire for food of any kind, at another only relishing particular kinds; and, perhaps, a few days afterward, evincing a general taste for whatever is introduced upon the table.

In the preceding species, jaundice is not a dangerous disease, except where the substance of the liver is very generally affected, so as to make an approach to the species before us. In green jaundice the patient rarely recovers. The progress of the disease is always slow, and the patient may labour under it for three, four, five, or even seven years. I have lately lost a patient, who had suffered under it for this last term of time, and was not more than forty-two at his death. He was a captain in the royal navy, of regular habits, who had seen hard service, and been severely tried by a change of climates.

Contrary to what occurs in all the modes of yellow jaundice, the morbid hue is here so deeply rooted in the system that it never quits it. If the patient recover, it may become a few shades lighter, but it never leaves his person altogether, and is always visible in the countenance.

When the pulse has been very slow, I have commonly found it connected with some affection of the head, and particularly apoplectic or epileptic fits.

As there is much obscurity in this disease, its medical treatment is indecisive. Mercurial preparations, which so often aid us in the first species, are rarely of service in the present. Dr. Baillie thinks he has found neutral salts, taken daily as an aperient, of palliative use; but of a radical cure he seems altogether to despair. It has appeared to me, that, though mercury fails when employed alone, combined with antimonials, it is often highly beneficial; and of all preparations of this kind, I have by far preferred the form of Plummer's pill, or, in other words, the submuriate of mercury in union with the precipitated sulphuret of antimony, with a warm stimulant of gum-resin. I have also found unquestionable benefit from a union of alkalis and bitter tonics, particularly the liquor potassæ with infusion of columbo. The aqua regia bath is another tonic well worth trying. I think I have found it serviceable, but have not yet employed it on a scale that enables me to speak peremptorily. Here also, as in spasmodic jaundice, the counter-irritation of the tartar-emetic ointment has occasionally proved highly beneficial. [A medicine, now found to be highly worthy of trial in melæna, is the rectified oil of turpentine, recommended by Mr. Adair (*Medical Facts and Obs.*, vol. iv.), as will be further noticed at the end of the next section.]

SPECIES II.

MELÆNA CRUENTA.

BLACK VOMIT.

OCCASIONAL VOMITINGS AND DEJECTIONS OF GRUMOUS BLOOD, INTERMIXED WITH DARK-COLOURED BILE; PUNGENT, TENSIVE PAIN IN BOTH HYPOCHONDRIA; COMPRESSIVE PAIN AT THE PIT OF THE STOMACH, AND FAINTING.

IN this species, the organs subservient to the formation of bile are generally in a more decayed condition than in the preceding: and it may hence be contemplated as a disease com-

pounded of melæna *cholœa* and hæmatemesis *atonica*, or passive hemorrhage from the vessels of the liver, spleen, or both; sometimes from those of the stomach.

Little as we know of the exact part performed in the animal economy by these organs, we see enough to convince us, that the functions of the liver and of the spleen are intimately connected; the blood in both is highly carbonated, as even the natural colour sufficiently indicates; and the closest alliance subsists between them. On which account Hippocrates calls the spleen the *left*, and Aristotle the *bastard* liver. It is a singular property of the blood of the spleen, that, like the catamenial discharge, it does not coagulate.

Dr. Home took a like view of this disease: and affirmed it to be produced, not by a mere effusion of bile of a darker colour, as in black or yellow jaundice, but by an effusion of blood also, which, however, he imagined to proceed from the meseraic veins. He relates three cases, in which the disease appeared to be carried off by a critical discharge; the first by a diarrhœa, and the other two by an efflux of sweat and thick urine.

[The preceding observations require some comment. The doctrine, that the disease is invariably connected with a morbid change of the liver and spleen, has been already refuted by a reference to dissections performed by M. Portal and Dr. Markland. The hypothesis also of ruptured vessels in these organs being the source of the blood in the intestinal canal, is very repugnant both to the plain truths of anatomy, and to the facts disclosed in the dissection of persons carried off by the complaint. According to Portal, three kinds of matter are vomited up in melæna; blood not changed; blood so changed as not to be recognised; and bile, which may also be of a deep black colour.—(*Mém. sur la Nature des plusieurs Maladies*, 8vo., Paris, 1808.) When the stools are inodorous, and present a yellow colour on being diluted with water, Dr. Brooks sets down the case as a bilious melæna, in opposition to the sanguineous.—(*Trans. of Assoc. Physicians of Ireland*, vol. i., p. 148.) Anciently the liver was fancied to secrete a yellow, and the spleen a black, bile; and the inky matter, which is sometimes vomited up, or discharged by stool, was supposed to pass from the spleen into the stomach through the vasa brevia. Dr. Home and M. Portal, however, have proved, that the black matter may transude from the minute arteries of the inner surface of the stomach and intestines; and that it frequently is nothing more than blood altered from its natural appearance by some peculiar action of the vessels.]

Dr. Baillie has, in a few cases, found this cocoa-like fluid thrown up in great abundance, where the stomach alone has seemed to him to have been solely affected, and the liver to have been apparently unconnected with it, though he admits the concurrent action of both viscera in other cases. But, in these special instances, there has been a peculiar obscurity or uncertainty, which is sufficient to justify us in not placing much reliance upon them. In certain cases, Dr. Baillie tells us, the patients were in some months restored to tolerable health; and here it is difficult to speak with precision as to the extent of the disease. In one case, this distinguished practitioner tells us, the stomach was examined after death; it appeared very capacious; but no structural disease, "so far as he recollects," was found either in the stomach, the liver, or the spleen.—(*Lectures and Observations on Medicine, Posthumous*, 8vo., 1825.

Intemperance, but especially habitual dram-drinking, is the common cause. Besides the symptoms noticed in the definition, it may be observed, that the countenance is chlorotic, and usually full of anxiety; the pulse is quick and feeble; the skin hot and dry; the strength greatly impaired.

As a symptom, this disease is met with in severe attacks of dysentery; but more frequently in those of yellow fever,* and especially that variety or stage of it which by some writers has been distinguished, though perhaps unnecessarily, by the name of Bulam fever. In this case, the black matter is often formed in a few hours, and at once thrown in great abundance from the stomach before it has had time to be absorbed and enter into the circulation, so as to produce the true atrabilious tinge upon the skin, which distinguishes the idiopathic malady.

In the case described by Dr. Markland, the whole line of the intestinal canal, in its villous coat, appears, on dissection, to have been more or less gangrenous; and half a pint of black grumous blood was found in the stomach. The liver, as already noticed, was of a pale brown colour, smaller than usual, with a shrivelled fissured surface, without either blood or bile.

In so worn out and exhausted a state of the affected organs, or perhaps of the constitution generally, as this disease indicates, little benefit is to be expected from medical treatment. Our first duty, however, is to clear the impeded passages of the grumous matter that obstructs them; and our next, to prevent as much as possible a fresh flow of it. For the former,

* Black vomit has been repeatedly observed by American practitioners, as occurring in yellow fever as it has prevailed at different seasons, and in various parts of the United States. Dr. Cothveall supposed it to arise from causes connected with a derangement of the biliary secretions (see Am. Phil. Trans., vol. v.); but Dr. Physic concludes more justly, from morbid examinations, that it is a secretion from the inflamed vessels of the stomach and intestines (*New-York Med. Rep.*, vol. v., p. 130); in which opinion Dr. Barton, of New-Orleans, coincides.—(*Am. Journ. of Med. Sci.*, No. xxix., Nov., 1834.) Dr. Lyons, however, thinks (*Lond. Med. and Phys. Journal*, Feb., 1828) that the matter of black vomit is identical with altered blood, and he has produced a fluid perfectly similar to it, by adding muriatic acid diluted with water to blood. Drs. Hosack, Francis, Townsend, and others, have witnessed this species of cœliaca in individuals of depraved habits who have been violently attacked with yellow fever. Sometimes a similar matter is vomited in the acute attacks of marsh fevers.—D.

gentle means, whether in the shape of purgatives or emetics, or both, will answer best; as we have a shattered fabric to work upon, and violence will only add to its weakness. For the second purpose, the alkalis have very generally been had recourse to, sometimes alone, and sometimes in the form of soap; but I have rarely found them of decided benefit. For these I have often substituted acids, and have preferred the vegetable to the mineral, particularly where the constitution has appeared to be broken down generally; as the patient is able to take a much larger proportion of the former than of the latter, because of the corrosive quality which the latter possess; and of the vegetable acids, the fermented or acetous have answered better than the native. Mercurials seem to be of as little service as in the preceding species; except where we have reason to expect a fresh accumulation of the morbific material, in which case they may be employed as a purgative. But between the paroxysms, bitter tonics, as columbo and simarouba, with such gentle exercise as may be engaged in without fatigue,—a light but generous diet, and the use of the Cheltenham waters, are what should chiefly be insisted upon, as best calculated to postpone the fatal issue.

[Our author conceived melæna cruenta to be a hopeless case, and when the liver and other viscera are much diseased, the prognosis must certainly be very unfavourable. It is rather extraordinary, however, that he should not have noticed the occasional efficacy of the oil of turpentine. Besides the observations of Mr. Adair and other practitioners in its favour, two cases of melæna cruenta cured by it are recorded by Dr. Brooks,* and another by Dr. W. Nicholl.—(Op. cit., vol. iii., p. 274.) The latter prescribed it as follows:—℞. Ol. terebinth. ʒss; syr. papav. alb. ʒj; aq. mepth. vir. ʒj. This draught was given five or six times in the first twenty-four hours, and the annexed clyster twice:—℞. Ol. terebinth. ʒj; mucil. acaciæ ʒiss; decoct. avenæ ʒxii. Afterward twenty drops of turpentine, with four black drops, were given every four hours, and five grains of the blue-pill at night. In addition to the preceding authorities in favour of turpentine, I may add those of Dr. Cheyne and Professor Elliotson. The editor has seen many cases of this disease in the great prisons, where he officiates as surgeon; and in some instances much benefit has resulted from calomel combined with opium, blistering the right hypochondrium, and giving small doses of the sulphate of magnesia in the compound infusion of roses.]

GENUS III.
CHOLOLITHUS.
GALL-STONE.

PAIN ABOUT THE REGION OF THE LIVER CATENATING WITH PAIN AT THE PIT OF THE STOMACH; THE PULSE UNCHANGED; SICKNESS; DYSPEPSY; INACTIVITY; BILIOUS CONCRETION IN THE GALL-BLADDER OR BILE-DUCTS.

In the preceding species we have had occasion to observe, that the bile is frequently found peculiarly viscid or tenacious, either from original secretion in this state, or from an absorption of its finer and more attenuate parts in the gall-bladder or appended ducts. In the disease before us, we find certain portions of it indurated, and assuming a concrete form, often of a crystallized, sometimes of a laminated structure, and perhaps most commonly of both,—evincing a tendency towards crystallized rays in the centre, with concentric laminæ towards the surface.*

[They have generally been considered as closely resembling spermaceti; are soluble in boiling alcohol; in ether; and also very slowly in oil of turpentine. The substance, like spermaceti, was regarded by Chevreul as a peculiar animal principle, and named by him cholesterine. There is, however, another kind of biliary calculus, resembling inspissated bile, but not, like it, soluble in alcohol and water. The two compositions are frequently blended together, forming biliary calculi of intermediate characters.†]

These concretions were supposed by Fourcroy to consist of a resinous matter combined with a peculiar oil, and a certain quantity of albumen, forming three of the constituent principles of bile. All these principles, however, have of late been denied by Berzelius, who has discovered that the bile becomes resinous only in the process of experiment, by supersaturating it with acids, while the material, hitherto regarded as albumen, is nothing more than a small portion of mucus, furnished from the gall-bladder.

In all instances, perhaps, gall-stones are inflammable; and when dry, blaze like wax in the flame of a candle. And in some instances Dr. Darwin suspects them to dissolve in the matter of the feces, and to pass away invisibly. It is possible, however, that the cases here alluded to were only examples of spasmodic jaundice; for nothing but the actual appearance of bilious concretions in the feces can fully prove their existence; while the general symptoms may be produced by other causes. Gall-stones differ in specific gravity: some have been found heavier than water; others a little lighter, bearing the proportion of nine to ten. In colour they are mostly dark brown; a few are white externally, though still brown within.—(*Heberden, Med. Trans.*, vol. ii., p. 137.)

It is possible that minute biliary concretions

* Trans. of Assoc. Physicians of Ireland, vol. i. The following is Dr. Brooks's formula:—℞. Olei terebinthinæ guttas xxv; aq. cinnamomi ʒj; syr. aurantii ʒj. M. Fiat haustus ter die sumendus.—ED.

* Baillie, Morbid Anatomy, fol. 5, pl. vi., p. 109–113. "C'est d'un changement dans la proportion des principes qui composent ordinairement la bile que résulte la formation des calculs biliaires."—Andral, Précis d'Anat. Pathol., tom. ii., p. 614.

† See Brande's Manual of Chymistry, vol. iii., p. 187. Professor Orfila first proved that some biliary calculi are essentially composed of picromel.

may be occasionally formed in the penicilli, or the pores of the liver, perhaps in the ducts; but the gall-bladder is the common seat of their origin; and they are here found of every diversified size, from that of a mustard-seed to that of a pullet's egg; often, indeed, not only completely blocking up the cavity, but distending the bladder far beyond its natural dimensions; and the passing such large concretions shows what wonderful efforts nature is capable of making towards freeing herself from a morbid encumbrance; for the natural size of the ductus communis choledochus scarcely exceeds that of a goosequill. The change thus occasioned is often very slow, and consequently accompanied with less derangement of the general health than we should expect; but as the bitter of the bile is produced in the cavity of the gall-bladder, and this cavity is hereby generally obliterated, the bile loses a considerable proportion of its bitter taste; and, possibly from the want of bile in the intestines, the evacuations are very irregular. The gall-stone, thus closely impacted, will sometimes remain quiet, and without being detached, for many years, with only occasional uneasiness in the hypogastric region.

[The circumstances leading to the formation of gall-stones are very imperfectly known; but a life of indolence is remarked to bring on a disposition to them. They are much more frequent in women than men, and are chiefly met with in persons who have passed the middle and active period of life.—(See *Gregory's Elements*, p. 488, ed. 2.)]

"In some patients," says Dr. Heberden, "the jaundice will disappear in two or three days: in others I have seen it continue near a twelvemonth before the gall-stone could pass into the intestine, or fall back into the bladder: nor will this long obstruction of the natural course of the bile have any lasting ill effects, or hinder the patient from being soon reinstated in perfect health after the removal of the obstruction." And as little real inroad upon the constitution takes place, in many instances, from a continuance of the concretion in the gall-bladder; "for many," observes the same excellent writer, "have been opened after their death, in whom a very large stone, or many small ones, have been found, without their ever having had in their lifetime any complaint which could certainly be imputed to this cause. A gall-stone weighing two drachms was found in the gall-bladder of the late Lord Bute, though he had never complained of the jaundice, nor of any disorder which I could attribute to this cause."—(*Med. Trans.*, vol. ii., p. 134.)

The irritation of a gall-stone has occasionally excited inflammation, and, where the gall-stone has existed in the liver, a large abscess; and the inflammation in the latter case assuming the adhesive form, the abscess has opened externally, and the calculus been discharged in this direction, of which a curious example is related by Mr. Blagden.—(Op. cit., vol. iv., art. xvi.) The calculus, on examination, weighed nearly an ounce and a quarter, and was of an oblong shape. The patient, who was a lady of sixty-six years of age, gradually recovered. [Sometimes a biliary calculus of very large size will produce an adhesion of the gall-bladder to the duodenum, followed by ulceration, by which means the foreign body passes into the bowels, and is voided with the stools. A case satisfactorily exemplifying this fact, is recorded by Mr. Brayne.—(*Med. Chir. Trans.*, vol. xii.) In other examples, however, biliary calculi of enormous size have made their way into the intestinal canal, through the ductus choledochus, of which instances have been published by Mr. Thomas, Dr. Craigie, and others.—(*Edinb. Med. Journ.*, No. 81.) Instances are related by Andral and others, in which one of the biliary ducts, or the gall-bladder itself, gave way, in consequence of the lodgment of a calculus in one of these organs, and the result was a rapidly fatal peritonitis, from effusion of bile in the cavity of the peritoneum.]

From the absence or presence of pain, the rest or transit of the gall-stone, which give rise to a considerable diversity of symptoms, as well as modes of treatment, the genus is divisible into the two following species:—

1. Chololithus Quiescens. Quiescent Gall-stones.
2. ——— Means. Passing Gall-stones

SPECIES I.

CHOLOLITHUS QUIESCENS.

QUIESCENT GALL-STONE.

PAIN ABOUT THE LIVER, AND AT THE PIT OF THE STOMACH, OBTUSE AND OCCASIONAL; THE BILE LESS BITTER THAN USUAL; THE DEJECTIONS IRREGULAR.

In the quiescent species, the gall-stone remains usually at rest in the gall-bladder or the liver; and whatever be its size, the growth takes place, and the containing organs dilate so gradually as to produce little or no inconvenience. In Dr. Baillie's plates, there is an example of a concretion of the size of a pullet's egg, which filled up the whole of the fundus. Yet so perfect was the adaptation of nature to the case, that the bladder not only became sufficiently enlarged at its base to hold the concretion, but was also sufficiently enlarged immediately above it to form a new reservoir, and contain very nearly the usual quantity, which the gall-bladder is capable of holding in its healthy state.

At times, however, even in this quiescent form of the disease, we meet with some degree of pain; occasionally, perhaps, produced by a sudden deposite of fresh concrescent matter; occasionally, by abrupt starts of some propulsive power which it is difficult to explain; and occasionally by some peculiar and temporary irritation in the coats of the surrounding organ, by which the bowels are apt to be considerably affected.

In this species, however, little medical treatment is necessary: for we have only to correct

the commotion of the alvine canal when thus excited, or to quicken its motive power when sluggish; and to have recourse to anodyne fomentations and narcotics internally, if there should at any time be severe pain. And, by palliatives of this kind, many a patient, as I have already observed, has been enabled to possess a comfortable enjoyment of life to old age, whose gall-bladder has, after death, been found loaded with concretions which, there has been good reason to conclude, had been gradually accumulating for thirty or forty years.

[An interesting case of death from inflammation of the gall-bladder, caused by the presence of a biliary calculus, was published by Dr. Scott of Cupar-Fife.—(*Edinb. Med. Journ.*, No. 83, p. 297.) On dissection, the coats of the gall-bladder were found to be half an inch in thickness; in its cavity was a stone, of about the size and shape of a green olive, with a few ounces of a thin blackish fluid, similar to very black-roasted coffee grounds, or rather to ink diffused through thin mucilage. A similar fluid was vomited up during the patient's indisposition.]

SPECIES II.
CHOLOLITHUS MEANS.
PASSING OF GALL-STONES.

PAIN AT THE PIT OF THE STOMACH ACUTE, EXTENDING TO THE BACK; FREQUENT VOMITINGS: DEJECTIONS WHITE, AND AT LENGTH LOADED WITH ONE OR MORE BILIOUS CONCRETIONS.

IT is not a little singular that, during the great anguish sustained in the transit of a gall-stone, the pulse is rarely or never quickened. "Insomuch," observes Dr. Heberden, "that this natural state of the pulse, joined with the vehement pain about the pit of the stomach, affords the most certain diagnostic of this illness. I have seen," says he, "a man of patience and courage rolling upon the floor, and crying out through the violence of this pain, which I was hardly able to lull into a tolerable state with nine grains of opium given within twenty-four hours, to which he had never been accustomed: and yet his pulse was all the time as perfectly quiet and natural, as it could have been in the sweetest sleep of perfect health."

Together with the pain at the pit of the stomach, which is acute in almost every instance, there is sometimes a pain also in the region of the liver; and not unfrequently it commences here. For this it is not difficult to account. Membranous canals, with a very few exceptions, are most sensible at their extremities; and an irritation excited in either extremity acts by sympathy upon the other. A stricture in the prostate gland produces pain, while making water, in the glans penis; and, notwithstanding the comparative insensibility of the rectum, which forms one of the exceptions to which I have just referred, faintness at the stomach is almost always accompanied with a relaxation of the sphincter ani, so that the stools issue involuntarily. Now, as a gall-stone is passing, the pain is greatest on its first entrance into any one of the ducts, or on its reaching the extremity of the ductus communis just before it is disgorged into the duodenum, in consequence of the greater sensibility of these parts. In the former instance, its direct seat is in the origin of the canal, near the liver; in the latter, in its termination towards the pit of the stomach: but as the one extremity acts by sympathy on the other, both these organs must be affected in a greater or less degree; and as the duodenum and stomach possess a finer sensibility than the liver, we perceive readily why the pain is more pungent in the former, than in the latter region. When the concretion has fairly entered the ductus communis, the pain remits, but generally returns with sudden violence on its reaching the duodenal point: and we hence see the reason of that additional attack of severe agony which a patient often sustains, after having flattered himself that the disease was completely subdued. The calculus, when voided, has sometimes been found to measure nearly two inches in its long diameter, and upwards of three inches and a quarter in its widest circumference.—(*Brayne, Medico-Chir. Trans.*, vol. xii., art. 21.)

In the treatment, all that we can accomplish is to ease, and, as far as possible, accelerate the course of the gall-stone. Formerly, when the gall-bladder was suspected to be completely gorged, its walls thickened from long-continued irritation, the concretions too large to be forced forward, and the pain permanent and severe, attempts were made to remove them by a section into the cyst. Bloch (*Medic. Bemerkungen*, No. v.) gives a singular case of this kind, in which not fewer than sixty-two distinct calculi were taken away with success. But in general the operation has not answered, or has been followed by a formation of other crops of concretions; so that Morgagni and many later writers* of eminence have strongly reprobated the use of the knife, and it is rarely or never had recourse to in our own day. In reality there seems to be no just cause for its use. At the time that the gall-stone is in the bladder, to whatever extent it enlarges, the progress of enlargement is slow, and the capacity of the gall-bladder will, in most cases, without much irritation, and sometimes with very little inconvenience, expand to meet its growth: while the moment it has quitted the cyst, and has entered into the duct, it is in vain to attempt to follow it up to any particular spot.

Our best and wisest exertions, therefore, must be of a palliative kind, with a view of easing and quickening the passage of the gall-stone. We have no direct means, however, of doing the last: and all we can hope to accomplish is that of rendering a little collateral assistance to the expulsive efforts which are made by nature herself. The duct becomes dilated by the circumambient pressure of the concretion as it gradually passes forward, urged on by the same action

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* De Sed. et Caus. Morb., Ep. xxxvii., art. 52 Sharp's Critical Inquiry, ch. vi. Le Dran, Consultations sur la plupart de Maladies, &c.

that propels the bile in a state of health. Vomiting, therefore, by compressing the whole abdominal viscera, and, particularly, the full and distended gall-bladder and biliary vessels, may afford one means of pushing forward the concretion: but a gentle force, and consequently gentle vomits, will promise fairer than those which act violently. Dr. Darwin affirms, that, in two instances, he saw from thirty to fifty gall-stones voided after taking only an oil vomit. If the patient be of tolerable vigour, and inflammation be apprehended, bleeding should precede the exhibition of emetics. Cathartics, by exciting the action of the intestines, and directly stimulating the mouth of the common bile-ducts, contribute, also, to excite action through its entire range, and thus farther favour the expulsion of the concretion. And as we often find its passage evidently opposed by spasmodic constriction, opium given very freely, and repeated every hour or two, and relaxing the skin by fomentations or the warm-bath, will in such cases be of essential service. Horse-exercise cannot always be made use of: but where it can be submitted to, it is one of the best auxiliaries we can recommend.*

We know of no solvent of biliary concretions worth attending to. The essential oil of turpentine was at one time regarded as a very powerful medicine of this kind; and, as such, was strongly recommended and very generally employed by Van Swieten (*Constit. Epid., Lugd. Batav.*, p. 102), Bloch (*Bemerkungen*, No. v.), Durande (*Obs. sur l'Effi. du Melange d'Ether Sulph. et d'Huile Vol. de Térébinth.*, &c., *Strab.*, 1790), and many other celebrated characters, sometimes alone, but more generally combined with alcohol, or the sulphuric or nitric ether. More recent practice, however, has not justified its possession of this virtue; and if it were ever serviceable, it must have been as an antispasmodic rather than as a solvent. Durande, indeed, seems to have acted upon this view; for his formula consisted of three parts of sulphuric ether to one of the oil. Yet, where there is danger of inflammation, such a medicine must be always too stimulant; and Dr. Percival has good grounds for remarking, that its internal use is productive of mischief.—(*Essays*, ii., p. 232.) It is not often that this disease proves fatal, or even essentially injures the constitution, except where there is an habitual predisposition to the generation of gall-stones, and the frame is worn out by a chronic succession of irritation and pain. [Such predisposition is, perhaps, best counteracted by the exhibition of alkalis, soap, nitric acid, taraxacum, and the Cheltenham and other mineral waters.]

* For the treatment of this affection, Dr. Stokes says (*Lond. Med. and Surg. Journal*, March, 1834), "bleed first, then leech, next employ purgatives, and when you have emptied the bowels, have recourse to opium." He remarks, that the employment of emetics is not free from danger, as instances have occurred where their exhibition was followed by rupture of the gall-bladder and fatal peritonitis. "Were I to hazard a conjecture," says he, "I would say, that *emetics can be employed with safety only in the early stage of the disease, when there is no obstruction from organic disease*; and again, you should *never use them when there is evidence of a distended gall-bladder*."—D.

GENUS IV.

PARABYSMA.

VISCERAL TURGESCENCE.

KNOTTY OR UNEQUAL INTUMESCENCE OF THE ABDOMEN FROM AN INDURATED ENLARGEMENT OF ONE OR MORE OF THE VISCERA CONTRIBUTORY TO THE DIGESTIVE FUNCTION; DERANGEMENT OF THE GENERAL HEALTH.

This genus is intended to comprise a natural and extensive division of diseases, consisting in an infarcted protuberance of one or more of the collatitious organs of digestion.

The name under which the disease has been described by Hippocrates, is *megalosplanchnia* (μεγαλόσπλαγχνις) or "big-bowel:" which Cusson and others, on account of its length, have exchanged for PHYSCONIA, a word literally importing "inflation;" and so used by both Greeks and Latins. For dismissing the former, there is, perhaps, sufficient reason; but physconia ill supplies its place, as conveying no correct or definitive meaning; whence it has been employed by different writers in so loose a manner, as to comprise a variety of organic tumours that have no relation whatever, in origin, position, properties, or mode of cure. The word, therefore, is not worth preserving, either in respect to its primary or general sense: and it is on this account I have ventured to exchange it for PARABYSMA (ΠΑΡΑΒΥΣΜΑ), from παραβύω, a genuine Greek term, in use among the Greek classics, and distinctly signifying morbid *congestion*, *coacervation*, or *infarction*, which is the prominent character of the genus.

All the viscera of the abdomen are subject to an indurated enlargement of this kind from various causes, of which some are common to the whole, and others peculiar to themselves; among the former should be especially noticed that destitution of valves in their veins, and consequently that want of support to the returning column of blood which belongs to the veins that are distributed to more superficial parts. The local causes will be noticed when treating of those enlargements in their respective order. The species are numerous, and may be arranged under the following heads:

1.	Parabysma Hepaticum.	Turgescence of the Liver.
2.	——— Splenicum.	Turgescence of the Spleen.
3.	——— Pancreaticum.	Turgescence of the Pancreas.
4.	——— Mesentericum.	Turgescence of the Mesentery.
5.	——— Intestinale.	Turgescence of the Intestines.
6.	——— Omentale.	Turgescence of the Omentum.
7.	——— Complicatum.	Turgescence compounded of various organs.

SPECIES I.

PARABYSMA HEPATICUM.

TURGESCENCE OF THE LIVER.

HARD TUMOUR IN THE RIGHT HYPOCHONDRIUM, VERGING TOWARDS, AND SOMETIMES APPEARING AT, THE PIT OF THE STOMACH; GENERAL LANGUOR; PALE OR YELLOW COUNTENANCE; DYSPEPSY; DEJECTIONS IRREGULAR, OFTEN WHITISH.

IT is necessary to observe, that the word tumour is used in different senses by different writers; commonly importing a morbid, and mostly a circumscribed swelling or enlargement of any organ; but limited by Mr. Abernethy to "such swellings as arise from some new production, and which make no part of the original composition of the body."—(*Surg. Obs.*, p. 68, 8vo., 1804.) This sense, however, he admits to "trespass against the usual import of the word;" and seems even too restricted for his own use; since he is soon afterward obliged, as he confesses, to extend it to enlargements of glands while they still continue to make part of the original composition of the body, and even to perform their function. In the limited sense here aimed at, TUBER would be a far better word than tumour, as less likely to produce confusion, and as already in some degree known to the language of medicine, in a restricted sense, by its diminutive TUBERCLE. In the present work, the term tumour is employed in its ordinary signification.

There is still much difficulty in accounting for the morbid growth of tumours of any kind, and especially of those which constitute the genus before us; which sometimes are found, on dissection, to consist of an enlargement or extension of the general structure of the affected organ; and sometimes of distinct lumps or tubers of a very different structure, imbedded in the body of the organ, seated on its surface, or merely attached to it by a narrow neck or footstalk.

The simplest mode of conceiving their origin, is by the deposite of some living fluid into a cell of the cellular structure, or the follicular gland of a mucous membrane, possessing an increased excitement by the pressure of the surrounding parts, or from some other cause of irritation. Mr. Hunter believed, as we shall have further occasion to remark when treating of phthisical tubercles, that "the living fluid which has the greatest tendency to assume a vascular structure when thus collected or effused, is the coagulable part of the blood," for which opinion there seems to be great reason.* And hence, those who have chiefly supported his doctrines in our own day, and especially Sir Everard Home (*Trans. of a Soc. for the Im. of Med. and Chirurg. Knowledge*, vol. i., p. 231) and Mr. Abernethy, confine the origin of vascular tuberous growths to the sanguiferous system, and especially its coagulable part alone; while Dr. Baron has still more lately restricted them quite as absolutely to the absorbent system: contending that "our hopes of being able to avert or cure such maladies must rest upon some other means than those which are merely calculated to subdue vascular action."—(*Inq. into the Nature of Tuberc. Secretions*, &c., p. 122.)

Either of these views appears to be too narrow. Mr. Hunter has sufficiently shown, that a

* To this opinion many pathologists would object. Mr. Abernethy's explanation of the origin of tumours seems to Mr. Lawrence to have been suggested by the statements of Mr. Hunter respecting the production of vessels in coagulated blood, the supposed agency of this process in effecting the union of wounds and fractures, and its occurrence in effusions of blood into serous cavities. "We now know that the adhesion of wounds, and the union of broken bones, are not accomplished in this way; moreover, that these processes take place most readily where no coagula are present. I have never seen any satisfactory proof of blood becoming organized when effused in wounds, bruises, or into serous cavities, or when deposited in aneurismal sacs."—(Lawrence, in Med. Chir. Trans., vol. xvii., p. 8.) Neither is Mr. Lawrence satisfied with the doctrine, that the growth of tumours depends upon the effusion of lymph, from inflammation. "Nothing," says he, "is more common, than the interstitial effusion of lymph, in consequence of inflammation; the substance thus poured out is not formed into tumours; it is absorbed as the inflammation subsides, or its partial organization causes the enlargement and condensation of the affected structure. None of the phenomena usually considered as characteristic of inflammation, are observed to precede the formation of tumours. These growths occur insensibly, and often arrive at a considerable size before persons are aware of their existence."—(Vol. cit., p. 9.) In the Museum of the Royal College of Surgeons are some preparations put up by Mr. Hunter, in proof of coagulated blood becoming vascular, as the vessels appeared to him filled with fine injection; but, in a conversation which the editor once had with Sir Astley Cooper upon this subject, the latter explains the appearance by the coagula having had lymph effused under and around them, and that the vessels had really extended themselves into the lymph, and not the coagulated blood itself. This view agrees with some experiments related by Gendrin.—(Hist. Anat. des Inflammations.) Professor Carswell sees various objections to Mr. Abernethy's view. The latter, we know, "referred all adventitious formations to the coagulable part of the blood as their origin, and fixed their seat in the cellular tissue, in the parenchyma, and on the surface of organs. This plastic substance was supposed by him to be effused under one or other of these circumstances, to become organized, and to derive the materials of its growth from the vascular system of the surrounding parts. It will readily be seen (says Dr. Carswell), that this view of the seat and origin of adventitious formations is both imperfect and inaccurate. Many of these formations are not organized, not tissues, as he believed, and as they were described to be about the same time, by Laennec, but *amorphous* masses, all the changes which they undergo being dependant on the influence of external agents." It is further argued, that Mr. Abernethy's doctrine assigns fictitious characters to these formations, and confounds under the same head diseases of an entirely opposite nature. Various reasons are also given against other theories promulgated by Andral and Cruveilhier.—(See Carswell's Illustrations of the Elementary Forms of Disease, p. 2.)—ED.

living principle appertains to almost all the fluids of the living body that are formed for its accretion, though the animal oil seems to possess less than any of the rest. He has shown it to exist in the chyle; it is known to every one to exist in the semen, and is transferred to the egg when it first drops from the body of the mother, and before a single particle of blood is elaborated. It is this, in truth, which is the instinctive principle of healthy living matter, whether animal or vegetable: instinct itself being nothing more than the simple law of life, or of such living principle in a state of activity or operation, directed to the definite end of completing single organs or the general system, preserving them in health, or reproducing them for future use.

It is hence probable that most, if not all the living fluids, and not merely those of the coagulable part of the blood, or the semen, have a tendency to produce new forms and tissues, and will do so under a particular state of excitement, and if duly supplied for this purpose. So long as a state of health, or the natural law of the instinctive principle, influences them, these productions will be uniform and definite; but if the healthy power decline, and the natural law dependant upon it cease, the action still continuing without a modifying guide, the productions must be indefinite and anomalous in every possible diversity, according to the contingencies by which they are surrounded. And hence, alone, as it appears to me, can we account for the elaboration of all those infinite varieties of fluids or of fabrics which different tumours present to us; and those monstrous attempts at organization which we occasionally meet with in organs of every description, sometimes simulating or even elaborating hair, sometimes flesh or muscular fibre, sometimes brain, sometimes suet, sometimes honeycomb or other cells, sometimes a tooth, or a nail, or various organs of a fœtus in a nidus where we should least expect to find it, and marvel with all our might how it could possibly get there. "The tumour," says Mr. Abernethy, "derives its supply of nourishment from the surrounding parts: it seems to live and grow by its own independent powers; and the future structure which it may acquire, seems to depend on the operation of its own vessels." All this is quite correct; and it is the object of the preceding remarks to show from what source it is possessed of such independent powers, and by what means they are rendered subservient to such an infinite variety of sportive and anomalous effects.

We have thus far supposed the morbid growths before us to have issued from the cellular texture, or the serous or mucous membranes of organs. But there is no difficulty in applying the whole of this argument to the substance or parenchyma of organs, as well as to their surface; for effusion may take place in any part of their structure, and the tubercle of the future tumour may consist of a minute drop of such effused fluid within the organized wall, or whatever it be that surrounds or imbeds it. And hence the morbid turgescence may consist either in an enlargement of the general substance of the viscus, or in parasitic tubers more or less closely connected with its surface. "There seems every reason to believe," observes Dr. Abercrombie, "that the peculiar deposition which constitutes it (tubercular disease) may take place from any tissue of the body: in some cases slowly and gradually; in others, the result of a low inflammatory action of a peculiarly unhealthy character."*

The organ hereby becomes weakened in its healthy action, and consequently is more disposed to fall a prey to whatever vermicles or their eggs are by any means able to obtain an entrance or a deposite in it: and hence it is nothing uncommon to meet with worms of various kinds, as we shall presently have occasion to notice, that have converted one or more tubercles into a nest, or other habitation; and to propagate their kind with great rapidity: and hence more especially the origin of flukes and hydatids in hepatic parabysma. Some constitutions are far more predisposed to such morbid changes than other constitutions; and some animals than other animals. The swine genus more perhaps than any of the rest. It is not, however, easy, and at times is perhaps impossible, to distinguish between simple limpid tubercles in their first formation, and hydatid worms. Dr. Baron has withdrawn himself entirely from the question, and employs the terms almost, if not altogether, synonymously, without venturing to determine upon the animalcular life of what are ordinarily called hydatids, under any form or magnitude. [According to Dr. Baron, the tubercle commences as a vesicle, and is nothing more or less than a hydatid. Dr. Armstrong finds, however, that the vesicular appearance of the tubercle is simply a accidental occurrence, dependant on the texture of the part in which it is placed. Tubercles, he says, may have the vesicular appearance in the lungs; but, if minutely examined, they will be found to be the extremities of the bronchial tubes, or air-cells, into which the peculiar deposite, constituting tubercle, often takes place.†

* On the Nature and Origin of Tubercular Disease. Trans. of the Medico-Chir. Soc. Edin., vol. i., p. 687. The following, as Dr. Carswell conceives, is a correct definition of tubercles, or rather of the tuberculous matter which constitutes the essential anatomical character of those diseases, to which the term tubercular is now exclusively restricted. "Tuberculous matter is a pale yellow, or yellowish gray, opaque, unorganized substance, the form, consistence, and composition of which, vary with the nature of the part in which it is formed, and the period at which it is examined." Dr. Carswell sets down the mucous system as by far the most frequent seat of tuberculous matter; as for instance, the mucous system of the respiratory, digestive, biliary, urinary, and generative organs. It is also formed on the secreting surface of serous membranes, and in the numerous minute cavities of the cellular tissue. One of Dr. Carswell's plates represents tuberculous matter in the substance of the brain and cerebellum, in accidental cellular tissue, and in the blood.—See Professor Carswell's Illustrations of the Elementary Forms of Disease, p. 1.)—Ed.

† This statement is confirmed by Professor

On the serous membranes, Dr. Armstrong has never found them to be, strictly speaking, vesicles. He regards tubercles as secretions from the ultimate ramifications of the arteries.—(*Morbid Anat. of the Bowels*, &c., p. 16, 4to., Lond., 1828.)] Dr. Jenner seems at times to have carried the animalcular hypothesis too far, even admitting that it has a real foundation; and the following passage which contains a valuable piece of natural history, may at the same time form an illustration of this remark. It occurs in a letter to Dr. Baron:—"Nothing is more common than tubercles in the liver, and among other viscera, of the pig: but these for the most part arise from the common hydatids with thin coats, while those which give birth to the term *measley*, are of a different kind. They pervade almost every part of the animal, the heart, the diaphragm, the serous and the mucous membranes, the eyes, &c. The disease proceeds not unfrequently to such great lengths, that from a fourth to an eighth part of the animal is infested with them. The inferior part of the neck and haunches now becomes œdematous, and effusions take place into the cavities. These hydatids differ from the hydatids of the liver, in being of a more diminutive size; they are for the most part not larger than ordinary shot, and to the feel are almost as hard; they differ too in having thicker coats, and consequently have less fluid within them. I have rarely seen them so large as middle-sized peas. Similar to this species of hydatid is that which pervades the interior of the brain of sheep, and appears to be generated on the coats of the ventricles. I have found them adhering to it, and also swimming in the fluid which had been let loose into these cavities, occasioning hydrocephalus internus, vertigo, and death."—(*Baron on Tuberc. Accretions*, p. 131.)

Now the character of this last hydatid, the *teniæ cerebralis* of Leske, has been sufficiently ascertained to admit its animalcular origin; it is rarely larger than a grain of sand, and is furnished with from thirty to thirty-six hooks, by which it fixes itself firmly to the substance of the brain or of its coats, and especially in yearling lambs, producing that staggering or vertiginous disease which is provincially known by the name of *dunt*. It is also highly probable that the first kind of hydatids here referred to are equally entitled to an animalcular classification; but the measley tubercles that form the second seem rather to be an idiopathic disease of the constitution itself, propagating new growths of the same kind from organ to organ through every part of the animal; and in the pig, as well as in other quadrupeds, well ascertained to be induced in many instances by innutritious food as an exciting cause.

It is conceived by many pathologists, that the intumescences we are now considering necessarily require an inflammatory action of the organ for their production; and that they are, in fact, for the most part, merely results of what is called chronic inflammation. M. Bichat has with great justness controverted this opinion in his remarks on membranous tubercles, that "foule de petits tubercules blanchâtres qui est si fréquent sur ces membranes" (*Anat. Gén.*, tom. iv., p. 517); and has said that we must look to another quarter than that of phlegmasiæ for their origin: although he seems manifestly to err in regarding tubercles of this kind as solely capable of originating from serous membranes, and never existing in the subjacent substance of an organ, except towards the last stages of the complaint, in which they are propagated by the cellular texture: being, in his estimation, "une affection propre à ces membranes; comme les eruptions miliares le sont à la surface cutanée, comme les aphtes le sont aux surfaces muqueuses." The nature of many of the morbid growths belonging to the present genus will abundantly show that tubercles of all kinds may take their rise from the interior as well as from the surface of organs; as their history will also, that they may originate without any sense of heat or pain, without any augmentation of the pulse, or any other sign of inflammatory action. A certain but low degree of such action may indeed accelerate their growth and augment their number, as one kind of exciting cause; but congestion from weak action is a cause far more frequent; and accidental irritation not much less so. The subject, however, is still a source of controversy; the opinion of M. Bichat that inflammation is not a necessary source of tubercles in any case, being powerfully supported by MM. Bayle, Laennec, Rostan, Louis, Velpeau, and Armstrong; while their origin from inflammation alone is as warmly contended for by M. Broussais and his numerous adherents.

[In particular, the latter is the doctrine adopted by Professors Andral (*Clinique Méd.*, tom. iii.) and Cruveilhier (*Bibl. Méd.*, Sept., 1826); and, as Dr. Alison observes, the testimony of Andral is the more valuable, as his previous opinion in regard to the formation of tubercles appears to have been nearly the same as that of Laennec. The paper and facts by Dr. Alison himself, in support of the same doctrine, are highly interesting.—(See *Edin. Med. Chir. Trans.*, vol. iii., ed. 1828.)

Dr. Armstrong, who inclines to the opinion of Bichat, has observed, that against the idea of tubercle being simply the effect of inflammation, many facts might be adduced. In numerous instances where tubercular points are scattered over the pleura or peritoneum, the serous membrane is transparent up to these points, and only becomes reddened or opaque when the

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Carswell's researches. "Encysted tubercle has generally been described as existing in the lungs, but I feel perfectly satisfied that the term encysted, whether applied to pulmonary tubercle, or to tubercle in any other organ, is almost always incorrect. In the lungs, encysted tubercle is a deception, *the distended walls of the air-cells having, in all probability, in almost every case, been taken for cysts.* In the like manner, the dilated bulbous extremities of the biliary system have been described as cysts of the liver containing tuberculous matter."—See Carswell's Illustrations of the Elem. Forms of Disease, p. 1.—ED.

tubercle has become progressive or enlarged, so as to act as a local irritant. He considers it probable that tubercle is connected with fibrinous effusion, but that the latter is not necessarily connected with inflammation. He admits that tubercle and inflammation are often co-existent, and so are the hydatid and tubercle occasionally; but co-existence does not imply a direct dependance or relation.*]

This disease originates from different causes, and is marked by symptoms and effects of very different kinds. The diversity of the symptoms however, is not always sufficient to point out the real nature of the swelling, which, in many instances, can only be determined by a post-obit examination. Yet the following varieties may be noticed as frequently distinguishable during life:—

α Coactum. Atonic turgescence.	From simple parenchymatous coacervation.
β Scirrhosum. Scirrhous turgescence.	Accompanied with a hard and scirrhous feeling.†
γ Chololithicum. Gall-stone turgescence.	Accompanied with an occasional discharge of bilious concretions.
δ Helminthicum. Vermicular turgescence.	Accompanied with an occasional discharge of worms or larvæ.

The first of these very generally paves a way to one or other of the three ensuing; and is found most frequently in feeble children who secrete little bile. It is also found very frequently in intemperate eaters, and in foreigners who reside in hot climates; a considerable degree of atony being produced in the liver from the exhausting stimulus of the rays of the sun, and an excessive use of spirituous potations.

In a scrofulous habit, a liver thus enlarged and infarcted, is apt to become scirrhous in children, if not early attended to, as it is also in the gormandizers just alluded to, who have long habituated themselves to the luxuries of the table. Sometimes the scirrhous is confined to a part of its margin; sometimes it appears partially on its surface; sometimes it runs through one or the other, or both its lobes: and sometimes also, the portion that becomes scirrhous evinces a tubercular structure, and consists of clusters of simple tubercles before the scirrhosity takes place.

It is not always, however, that a scirrhous, or even a tubercular structure of the liver occasions its enlargement. In many instances, indeed, it does so; but Dr. Baillie has given examples, illustrated by plates, in which the liver has hereby shrunk into a size considerably below its natural proportion.* This disease may be generally detected by an accurate examination of the hypochondrium with the hand.†

* Armstrong, Morbid Anat. of the Bowels, &c., p. 17, Lond., 1828.

† Excluding from present consideration chronic hepatitis, treated of in another part of this work, many of the different conditions of the liver seem to be intended to be comprised under these two first divisions; as, for instance, 1. Simple enlargement of the liver, without change of texture; 2. Tubera of the liver, without disease of its structure; 3. The pale degeneration of the liver, consisting of change of colour, without remarkable alteration of texture; 4. Pale colour of the liver, with induration; 5. Dark induration of the liver; 6. Tuberculated disease of the liver; 7. Tubercles and tubera of various characters, diffused through its substance, with disease of the intervening structure. These and other morbid states are excellently described by Dr. Abercrombie.—(See Path. and Pract. Res. on Diseases of the Stomach, Liver, &c., ed. 2, p. 364, et seq., 8vo., 1830.) The black ramollissement or disease, in which the liver is reduced to a dark-coloured mass, of very little consistence, could not, of course, be comprehended under Dr. Good's general definition; neither could the soft, flabby, fatty degeneration of it; but the white encephaloid disease of this organ, corresponding in its nature to fungus hæmatodes, would belong to this place. In considering chronic diseases of the liver, it is necessary to recollect, that this organ consists of a sanguineous or red part, and of a white or yellow, containing bile. Sometimes it is only the red portion that is hypertrophied, so that the organ is enlarged and red; and sometimes the biliary portion, with the bile-tubes in a state of hypertrophy, and then the liver is enlarged and pale. Sometimes without being enlarged at all, it will be pale. The red part is atrophied, the vessels shrink, and the biliary part is either hypertrophied, indurated, or not changed at all. The whole of the liver is sometimes affected in these ways; and, in other instances, only spots, or parts of it. In some situations there may be hypertrophy of the red substance; in others, of the biliary; so as to cause a mottled appearance of the organ when a section is made of it. In what is termed the *gin-liver*, white lines are seen traversing it, and sometimes granules, varying in size from pins' heads to hazelnuts. Professor Elliotson, from whom the editor has borrowed these valuable remarks, adopts Andral's belief, that the free use of ardent spirits induces a chronic change of the biliary portion of the liver, in which it becomes both hypertrophied and indurated. Sometimes the liver is hardened in particular parts of it; but, on the whole, diminished in size. A gin-liver is mostly of a bright yellow colour, and attended with a degree of ascites, and an opacity and hardness of its peritoneal covering.—See Medical Gazette for 1832-3, p. 484.—Ed.

* Morbid Anat., pl. ii., fig. ii., p. 102. In the disease of the liver, described by Laennec, under the name of *Cyrrhose*, from the part looking like a mass of yellow wax, and thought by Cruveilhier to correspond to a tuberculated form of liver disease, spoken of by Dr. Baillie, there is a diminution of the organ, and much deviation of it from its natural shape. It is beautifully illustrated by coloured engravings, in Cruveilhier's Anatomie Pathol., douzième livraison. This pathologist finds that cancerous tumours in the liver are most disposed to form towards its surface, and refers to a case, in which sixteen out of twenty were so situated. The name he assigns to this affection is, "Cancer du foie par masses disséminées." These masses vary in size from that of a miliary seed to that of the head of a full-grown fœtus. He includes, however, in his observations, not merely scirrhous tubercles and tumours of the liver, but those of the fungus hæmatodes kind; and, what will seem extraordinary to English pathologists, asserts that he has met with both varieties in the same liver.—Ed.

† This shrunken condition of the liver is not

Almost all the affections of the liver appertaining to the division before us appear to owe their origin to atony or hebetude in the organ: and hence the common rise of that VARIETY of turgescence which is accompanied with BILIOUS CALCULI. These are sometimes diffused like granules over the substance of the liver, or among the biliary pores; they are sometimes confined to, and load one or more morbid cysts existing in the liver; and are sometimes naked, concrete, and crystallized; of which I have referred to various examples in the volume of Nosology. These are occasionally to be found in the dejections.

In the variety distinguished by the existence of GRUBS AND WORMS, the fluke is, perhaps, sometimes to be found even in the human liver. Doever and Clarke, as already observed, assert this, and Darwin confirms their assertion. That they are found in almost all other animals is admitted by every naturalist; although Dr Harrison, of Horncastle, has lately ventured to deny that they are to be traced in sheep in the well-known disease called the rot. But the vermicles chiefly observable in the variety of parabysma before us, are hydatids.

"These," says Dr. Baillie, "consist of spherical bags of a white or light amber colour, more or less transparent, and are lodged in cartilaginous cysts. The cysts are lined with a brownish pulpy membrane, resembling very much the coagulum of the blood; but this membrane is more or less distinctly marked in different cases. The cysts are sometimes surrounded on every side by the substance of the liver, and sometimes are formed at the surface so as to be partially seen without dissection. The hydatids themselves contain a transparent fluid, which is capable of being coagulated by heat and by acids, and sometimes contain also smaller hydatids floating in this fluid. On many occasions very small hydatids are found adhering to the coats of the larger hydatids, and appear to the eye like small pearls. Hydatids of this species seem to be animalcules of a very simple structure; and although they are not often formed in the liver, yet they grow more frequently in this gland than in any other of the body."*

The hydatids die in process of time like other animal forms, and their place is supplied by their progeny. When they die, the bags and cysts are often broken up, and become frittered into minute tatters and filaments, fragments of which pass occasionally by the biliary ducts into the duodenum; and, being rejected with the feces, are at times mistaken for portions of the villous coat of the intestines.

As this species of parabysma depends almost entirely on an atony of the liver, the intumescence increases in many instances in proportion to that atony, and particularly where debility of the liver is combined with a general debility of the entire system. And hence the liver is frequently known to enlarge in proportion as every other organ becomes torpid and decays. On which account the liver is often found of an enormous size in dropsical patients. Mr. Gooch gives a case in which, during dropsy, it acquired the monstrous weight of twenty-eight pounds.—(*Med. and Surg. Obs.*) Baldinger reports another instance in which it reached twenty pounds (*N. Magaz.*, band. vii., p. 275); and Bonet a third in which it weighed only two pounds less.—(*Sepulcr.*, lib. i., sect. xviii.)

In recent stages, and especially in children and young persons, this disease may often be successfully attacked by warm purgatives and tonics, and especially by those valuable alterants that change the action of both the excretory and absorbent system, diminishing the irritability of the first, and restoring the power of the second, and thus reinvigorating them alike.—(*J. Kaemph., Abhandl.*, &c., 8vo., Leips., 1736.) Many of the metallic salts and oxydes have a tendency to do this, and especially those of zinc, copper, iron, and silver. But those of mercury are, for the present purpose, far more valuable than any of the rest. This mineral should be given in mild forms and gentle doses only, so that it may be persevered in for a considerable period of time. The black or red sulphuret of mercury, or the blue mercurial pill, has been employed indiscriminately; but small divisions of calomel, as a grain or a grain and a half a day for an adult, or the compound

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uncommon in those who have long indulged in the use of ardent spirits. Dr. Hosack (*Essays*, vol. ii., p. 332) has related such to have been the fact on inspecting the viscera of the celebrated tragedian Cooke.—See also Francis's Cases of Morbid Anatomy, in the Trans. of the Lit. and Phil. Soc. of New-York, vol. i., p. 534. Dr. Francis informs me, that he has repeatedly observed the liver greatly diminished, and of a firm and scirrhous state, in the bodies of gross inebriates, who have died suddenly, and have been dissected for municipal purposes.—D.

* Morb. Anat., p. 107, pl. 6. The kidneys and the liver are the two organs of the body which are most subject to the formation of hydatids. In sheep, they have been observed to have a contractile power; but this has not been noticed in the human subject. They sometimes lie within one another, like pill-boxes; sometimes they are attached to each other by peduncles from within, hanging one within the other; and sometimes they grow to the outside of each other. Sometimes they are attached to the liver externally; but generally speaking, are enclosed in a cyst.—(See Elliotson's Lectures, Med. Gazette for 1832-3, p. 486; also Cruveilhier's Anat. Pathol., livr. 3.) The editor attended a man in the King's Bench, about two years ago, whose abdomen was occupied by a cyst containing several gallons of hydatids, the size of which varied from that of an orange to that of a pea. As the swelling was attended with fluctuation, a trocar was introduced into it, when nothing was discharged but a trivial quantity of glutinous matter. The cyst, which was found after death to be attached to the liver, is placed in the Museum of the London University. Dr. Elliotson attended a curious case of this kind, in which an ulcerated communication was established between the cyst and the air-passages, through the diaphragm; and consequently the patient used to cough and spit hydatids until she died. For some interesting remarks on encysted tumours of the liver by Mr. Cæsar Hawkins, see Med. Chir. Trans., vol. xviii.—ED.

calomel pills, in the proportion of five or six grains a day, will often answer much better. In the meantime, an occasional purging must be persevered in; and if worms be suspected in the intestines, they must be removed by the treatment already laid down. I have also found benefit from an application of the emplastrum hydrargyri cum ammoniaco, large enough to cover the entire hypochondrium: or the use of the tartar-emetic ointment, as already recommended in certain conditions of dyspepsy; and, where particular circumstances have prevented me from using this, from sponging the abdomen daily with aqua regia, diluted with about forty times its measure of water, which, as already observed, reduces it to the sourness of weak vinegar.

As far as my own experience goes, I have had so much reason to be satisfied with the good effects of mercury, that I have rarely employed any other medicine; and, though I cannot say, with Dr. Cullen, that its effects are to be ascribed solely to the stimulus it gives "to the excretories, and not at all to any change produced in the state of the fluids," yet the following remark of the same distinguished writer is entitled to general attention: "Universally mercury, in its active state, seems to be a stimulus to every sensible and moving fibre of the body, to which it is immediately applied; and, in consequence, it is particularly a stimulus to every excretory of the system to which it is externally or internally applied. Besides its noted effects upon the excretories of the saliva, it seems to operate upon the whole of those of the alimentary canal. It proves often diuretic; and I have particular proofs of its reaching and acting upon the organs of perspiration. Although it may sometimes operate more upon certain excretions than upon others, it may be presumed that, when any tolerable quantity is thrown into the body, it is in part distributed over the whole; and therefore its medicinal effect is, that it is the most universal aperient and deobstruent known."—(*Mat. Med.*, part ii., chap. xvii., p. 443.)

I have not, however, found that it gains much advantage, at least in the disease before us, by being united with sulphur, or sub-doses of nitric acid, as in the pulvis mercurii cinereus of the late Edinburgh Pharmacopœia; but the sulphurets of antimony seem to increase its effect. M. de Sauvages relates a singular case of this disease, in which this compound effected a cure, upon the authority of M. Broussonet, in whose practice it occurred.—(Class x., Ord. ii., Gen. ix., Physconia, § 3.)

When the disease exists in feeble children, repeated emetics have been of service, by rousing the torpid absorbents of the liver into fresh action. As the use of the prussic acid has of late been revived for several kinds of visceral affections, I ought not to omit stating that, in the form of an infusion of laurel-water (*prunus laurocerasus*), it is said by various writers to have been serviceable in the disease before us, some of whom have tried it externally, others internally, and a few in both ways (*Baylie's Pract. Essays; Percival's Pract. Essays*, vol. i., p. 36); but, as I know nothing of it from my own experience, I limit myself to giving this hint.

The preparations of iodine have a far better claim to our attention, not only in respect to the present, but to all the species of parabysma, from their peculiar tendency to promote absorption in morbid growths in general. Dr. Baron (*Illustrations of the Inq. respect. Tuberculous Diseases*, 8vo., 1822), who has extended and enlarged on M. Coindet's experiments, thinks there is no medicine that can rival their salutary powers. But we shall have occasion to notice them still further when discussing bronchocele, in which they seem especially efficacious. In every trial, however, whether external or internal, they require more caution than is ordinarily exercised, and should be commenced in very small and circumspect doses.

There is also another remedial plan, which has been greatly praised at various periods, and especially of late, for its certainty of success, and that is, a protracted nausea. In many cases this has been unquestionably, and even eminently, serviceable; and tuberosities of extensive range, and in some instances when seated on the surface of the body, or the extreme membranes, occasionally even those of bronchocele, have been wonderfully diminished, or even entirely removed, in a few weeks.

It is only, however, when the general habit appears good, and the general strength pretty firm, that we can reasonably expect any advantage from protracted nausea; and hence, comparatively, but rarely in the present disease, which, as already observed, is for the most part an effect of laxity of structure, or hebetude of action. Weakly infants and children are far more subject to abdominal enlargements of the kind before us, than those in health; and it is well known that we may at will produce any extent of tubercles in the liver of rabbits, by feeding them with poor or insalubrious food.*

* Under the name of "parabysma hepaticum," Dr. Good seems to have brought together various structural diseases of the liver, the morbid anatomy of which are more particularly described by Laennec, Andral, Abercrombie, Cruveilhier, and other pathologists. "These are diseases," as Prof. Elliotson has observed, "in which you can do nothing more than treat the patient upon the common principles of inflammation, and endeavour to excite absorption by means of iodine and mercury, and support the patient's strength. As to the greater number of them, you cannot, of course, distinguish them during life. You can tell that there is organic disease, by feeling that the liver is very large; and sometimes you find there are tubera, bumps in the region of the liver; but very often it is impossible to say what exact structural disease there is. If you have seen fungus hæmatodes, or scirrhus in other parts of the body, you may suppose the disease to be of the same nature."—(Med. Gaz., 1832-3, p. 486.) Dr. Abercrombie is not so much an advocate for mercury as the generality of practitioners are: for those chronic affections of the liver which are beyond the reach of any human means, he thinks that the treatment should be entirely palliative, consisting of a careful regulation of the diet and

SPECIES II.

PARABYSMA SPLENICUM.

TURGESCENCE OF THE SPLEEN.

INDURATED TUMOUR IN THE LEFT HYPOCHONDRIUM, VERGING TOWARDS THE SPINE; PALE COUNTENANCE; GENERAL DEBILITY.*

ENLARGEMENT of the spleen is, for the most part, less mischievous than enlargement of the liver; and there is hardly any organ that either nature or art may take so many liberties with, without seriously affecting the general health. It has been found wanting (*Pohl. Pr. Casus anatomicus*, &c., *defecta Lienis.*, Lips., 1740); it has been found double (*Schenck*, observ., lib. iii., N. 84; *Cabrolius*, observ., N. 15), and even treble (*Schenck*, loc. citat.);† and, when in a state of disease, in a few rare instances, it has been utterly extirpated without injury,* or has continued of an enormous size for thirty years and upwards.—(*Darw.*, i., ii., iii., 18; *Sauv.*, loc. citat.) [But, though the spleen cannot be regarded as a vital organ, or one of much sensibility, it appears, as Dr. Abercrombie has correctly remarked (*Edin. Med. Journal*, No. 80, p. 1), to exert an important influence upon the functions of the stomach. It may, however, only have this influence when diseased, for, according to numerous experiments performed under the inspection of Baron Dupuytren, the spleen may be removed from dogs, and yet such of these animals as recover from the operation, live afterward, without the slightest impairment of their digestion, absorption, circulation, respiration, power of barking, secretions, nutrition, locomotion, sensibility, sensations, instinctive faculties, and generative functions.—(*L. et P. P. Assolant, Recherches sur la Rate*, 8vo., Paris, 1802.) In general, however, in the human subject, the more the spleen exceeds its natural size, and the longer it continues in this state, the greater is the emaciation of the individual, and the impairment of his health. Respiration, digestion, and the functions of the intestinal canal, must, indeed, unavoidably be disturbed by any considerable enlargement of this organ.

The spleen is liable to acute and chronic inflammation (splenitis); to suppuration;† mor-

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the bowels, with mild tonics, &c. This he conceives to be a point of much practical importance, because these affections often exist for a long time, without materially injuring the health of the patient; and, by treatment entirely palliative, his life may be perhaps prolonged, and certainly rendered more comfortable. But, when such cases are treated actively by courses of mercury, the strength, he says, uniformly sinks in a very rapid manner, and the patient's life is often evidently shortened. In several cases of chronic affections of the liver, accompanied by jaundice, he has seen very good effects from the external use of iodine, ʒss. to ʒj. of hog's-lard.—(See Pathol. and Pract. Researches on Diseases of the Stomach, Liver, &c., p. 386.) Where the liver is enlarged by the growth of acephalocysts in it, the frequency of more than one cyst is a consideration against undertaking any operation for their discharge, and we must agree with Cruveilhier, that the attempt would only be justifiable, when the cyst became adherent to the parietes of the abdomen, or was disposed to make its way outward, and burst of itself. The success which M. Recamier had by puncturing a tumour of this nature, and then employing caustic potassa and injections, is justly considered by Cruveilhier as an exception to what would generally be the result of such practice.—(See Anat. Pathol., livraison 3, p. 3.) The bilious discoloration of the fluid in these cysts, often noticed, is ascribed by this eminent pathologist to the biliary tubes not being obliterated in the part occupied by the disease, the consequence of which is, that they effuse bile into the cavity where the acephalocysts are contained. In the case which he has related, the patient did not die of the disease of the liver, or the ascites, but of a gangrenous affection of the lower extremities, arising from an anasarcous distention of the cellular membrane, and the irritation of scarifications.—ED.

* The spleen sometimes produces an external swelling, without being enlarged; as when fluid in the pleura presses the diaphragm towards the hypochondrium, and forces the spleen from its usual situation. Enlargement of the left lobe of the liver, or of the left kidney, or certain tumours of the peritonæum itself, may have a similar consequence. See Andral, Anat. Pathol., tom. 2, p. 423.—ED.

† Heusinger, in his *Mem. sur les Monstr. de la Rate*, &c., p. 62, alludes to the existence of seven spleens in a subject; and Otto, in his *Hand. der path Anat.*, p. 302, mentions a case where twenty-three accessory spleens existed.—D.

* Valisneri, Opp. iii., p. 128. Bartholin., Hist. Anat., Cent. iv., Hist. 51. Ferguson, in Phil. Trans. for 1738.

† According to Andral, pus is found sometimes in the form of separate little drops in the midst of the coagulated blood of the splenic cells, and sometimes in more ample collections, constituting true abscesses. Some of these are separated from the parenchyma of the organ by a pseudo-membrane; while around others, nothing of this kind is remarked; the pus and blood having no partition between them. Andral has seen one case, in which about three fourths of the parenchyma of the spleen contained nothing but pus; the fibrous tissue, in contact with it, being in some places unaltered, but in others softened, pulpy, and in progress to destruction. Where the pus had approached the capsule, this was considerably weakened; and it is conceived that if the patient had lived a little while longer, the pus might have escaped into the cavity of the peritoneum. In fact, abscesses of the spleen, having such a termination, are recorded; while others have burst into the stomach, colon, thorax, or urinary organs, or outwardly through the muscles of the abdomen, or back. One fact, well deserving of recollection, is, that the formation of pus in the spleen seems frequently to be simultaneous with suppuration in other viscera. In an example recorded by Andral, the original disease was in the uterus, in the substance of which, and also in its veins, collections of matter were found after death; but abscesses were likewise noticed in the veins of the pelvis, the spleen, lungs, liver, and brain: examples in which pus is observed only in the spleen, are considered by Andral as less frequent. One case of this description is mentioned, which took place in a child three years of age, the spleen being converted into little more than a pouch of matter, with hardly any vestiges of its parenchymatous texture remaining. During life the symp-

tification; tubercular disease, and the slow suppuration usually following that affection. Inflammation may affect either its external peritoneal covering, or its substance, or, as Andral would say, its fibrous tissue.* The first case may be restricted to the investment of the spleen; but, in almost every instance, the peritoneum of the adjacent organs participates in the affection. In peritonitis, also, the external coat of the spleen is inflamed as well as the rest of the peritoneum. Dr. Abercrombie had an opportunity of seeing a spleen that was studded throughout with innumerable tubercles, all in the solid state, in the body of an infant, aged eight months, who died of extensive disease of the bronchial glands. In a more advanced stage, this tubercular affection presents numerous small abscesses, resembling the vomicæ of tubercular lungs. The disease, however, is usually complicated with tubercular disease in other organs, so that it is impossible to ascertain the symptoms which arise from the affection of the spleen.—(*Abercrombie*, op. cit.) Perhaps the tubercular enlargement may be more disposed to occur in scrofulous constitutions; but it is less frequent than other chronic swellings of the spleen.]

Parabysma splenicum, as a species, is traced under the following varieties:—

α Coactum. Ague-cake.	From simple chronic enlargement.
β Scirrhosum. Scirrhous turgescence.	Accompanied with a scirrhous feeling.
γ Cartilaginosum. Cartilaginous turgescence.	Accompanied with a cartilaginous induration of the coats.

The FIRST VARIETY occurs sometimes as a consequence of menostation, or of a peculiar kind of rheumatism; but chiefly after obstinate remittents or intermittents, in strumous or other weakly constitutions, or which have been previously debilitated by intemperance.† [It generally arises from intermittent fever, but it may take place from other causes, as from suppressions of the menses, or hemorrhoidal discharge. It is also met with, especially in warm climates, in feeble, unhealthy children, and seems to be produced by damp situations and bad nourishment.—(*Abercrombie*, op. cit., p. 411, ed. 2.)] When agriculture was in a ruder state than in our day, and the land left in many parts swampy, and undrained of its stagnant waters; and, consequently, when tertian and quartan intermittents were far more common than they are at present, this disease was also far more frequent and more obstinate. An injudicious and immoderate use of the bark is said also to have contributed to this affection, and very generally to have increased it. And although we meet with no such mischievous

toms had been, acute pain in the left hypochondrium, continued fever, and some symptoms of irritation of the membranes of the brain. The latter organ, however, as well as the digestive canal, was quite healthy. In some soldiers who had suffered from Walcheren fever, Mr. Wardrop found the spleen reduced to a cyst, full of puriform matter.—See Baillie's Works, ed. by Wardrop.—Ed.

* Exclusively of lymphatics and some nerves, only the following elementary parts are found in the spleen:—1. A fibrous tissue forming externally the capsule, and divided internally into a multiplicity of filaments, among which the blood is effused. 2. A vein, which, in the whole of its course, communicates with the cells by large openings, or perforations in its parietes, and whose cavity is at length confounded with the cells themselves. 3. An artery that splits, directly after its entrance into the spleen, into an infinite number of small branches, which cannot be traced far, but appear to be distributed to the parietes of the cells. See Andral, Anat. Pathol., t. ii., p. 416.

† Andral entertains peculiar opinions respecting the origin of diseases of the spleen: some rare ones, he observes, are seated in the parietes of the internal cells, or in the capsule. The others, which are far more common, and of higher importance, are situated in the matter itself contained in the splenic cells. Although this matter, this coagulated fibrine, has no distinct organization, it is perhaps more alive than the fibrous tissue around it. More frequently than it, then, it may be affected by irritation; its nutrition may be so altered, that various morbid products are separated from its own substance; and pus, worms, &c., may be generated within it. The primary cause of several of these changes is quite unknown; but there are some others, in which the cause is entirely physical, and more easy of estimation. Thus, certain modifications of colour and consistence, sufficiently remarkable to obtain the name of cancers of the spleen, appear to be simply connected with *obstruction* of one of the venous branches running more or less directly into the splenic vein. In this case, the detention of a little fibrine in the cells of the spleen would seem, according to Andral's views, to be adequate to lead to such modifications of this fibrine, as may give it a carcinomatous, tubercular, or other morbid appearance, &c. Softening of the spleen he refers to the blood in its cells being fluid; induration, to its dense consistence: change of size, he ascribes to the blood not being returned by the veins with due quickness, or to its deposition in the cells by the arteries, and its subsequent organization and enlargement. Even the formation of pus, he conceives, may arise from changes in the blood, and in the cells of the spleen. In a part of these doctrines, we recognise the Hunterian opinion concerning the vitality of the blood, and its power of producing vessels within itself, when extravasated or stagnant in living textures. Yet, attentively as these opinions have been examined, and compared with the facts disclosed by morbid anatomy, they are far from being confirmed to the extent which Hunter, and especially Andral, would go. When the fibrine of the blood, or coagulated lymph, becomes vascular and organized, it is now most generally believed, that the vessels shoot or grow into it from the adjacent ones. Indeed, Andral, after all, does not quite disregard the co-operation of the surrounding vessels in the work of disease; for, says he, the blood in the cells of the spleen, in consequence of having lost its wonted qualities, may act as a foreign body, and irritate the surrounding parts. Then in the latter may commence a process of reaction, the result of which may be sometimes the adhesion of a morbid part, and its separation by a partition from the rest of the spleen; sometimes its explosion.—See Anat. Pathol., tom. ii., p. 419–426.—Ed.

effects in the present day, there can be little doubt that there was much ground for such a charge formerly. In intermittent fevers, Peruvian bark, copiously administered, is not an idle medicine; for if it do not assist, it will be sure to injure. And as it was formerly given in large and frequent doses, in districts where the patient was daily exposed to the operation of the same swampy miasm that produced the disease at first, it is difficult to conceive how it could produce any benefit.*

"In enlargement of the spleen," observes Dr. Vetch, in an excellent essay upon the subject (*Medical and Physical Journal*, 1824), and whose professional employment among the British army at Walcheren afforded him a large field for observation on the disease before us, "the patient seldom or never complains of much pain in the situation where it might be expected: his appetite is generally good, yet his powers of assimilation are obviously deficient: he loses flesh, and is incapable of any muscular exertion. His features have a peculiar, dark, bilious, or mahogany hue; but the conjunctiva preserves its white and healthy appearance. Perspiration is in time wholly suspended, and the skin acquires the appearance and feel of satin; the lips are pale, and there is generally much wasting of the gums; the urine is limpid, and secreted very rapidly, but contains little or no urea. The patient's mind is generally morose and desponding." The extremities are commonly colder, and the pulse quicker, than in health, especially towards the evening. [Dr. Abercrombie states, that the bowels are generally irregular, and the motions dark-coloured. There is frequently a dry cough, and, in protracted cases, hæmatemesis, and, at last, general dropsy.†

One of the most singular facts in the pathology of the spleen, adverted to by the same physician, is the very rapid manner in which enlargement of it sometimes takes place, and the equally rapid manner in which it may subside. Several years ago he saw, along with Dr. Combe of Leith, a seaman who had contracted ague a few weeks before: there was a firm defined tumour in the situation of the spleen, and projecting downwards several inches; in about a week after this visit, the fever had subsided, and the tumour was entirely gone.

Probably this variety of parăbysma splenicum never depends upon tubercles, though enlargements of the organ, from this cause, are not unfrequent.* Dr. Abercrombie has seen an immense bag of hydatids covered by the peritoneal coat of the spleen, the substance of which was little altered (*On Diseases of the Stomach*, &c., p. 414); but this also is an affection that has no connexion with ague.]

When this variety of parabysma has occurred in feeble children, it has often been dispersed by emetics given repeatedly, which stimulate the absorbent vessels into increased activity, and act with considerable success, where a persevering nausea might prove highly mischievous.

Cataplasms that excite vomiting have, for the same reason, in many instances, had the happiest effects. They have commonly been made of tobacco; and Mr. Stedman gives instances of its proving an effectual remedy in both the varieties now adverted to, and in an old man as well as in a boy.—(*Ed. Med. Essays*, vol. ii., art. v.) The former had in the first instance been attacked with a general numbness, in consequence of sleeping in the open air in the West Indies, while the serenadas, or night-dews, were gathering around him. This was succeeded by a jaundice, and the jaundice by a parabysma of the liver, in which the spleen also appears to have catenated; the turgescence continuing to increase for five years, in spite of the medicines prescribed for him. A tobacco poultice was at this time applied, and renewed daily for a month. It produced frequent vomitings; but, at the end of the month, the patient was cured. The quantity employed at a time was six ounces: for a child, one ounce is sufficient. Cataplasms of common groundsel (*senecio vulgaris*, Linn.), the erigerum of the dispensatories, are said to prove equally useful by exciting a like effect.

Dr. Vetch, from an extensive experience of

* A remarkable case of enlarged spleen, occurring in the practice of Dr. W. M. Lee, of South Carolina, is recorded in the Am. Jour. of Med. Sc., No. xxiv. The spleen, when removed, weighed five pounds and a half, and the disease was not preceded by intermittent fever. The doctor states that his treatment is alterative doses of mercury at night, aided by frictions of tinct. of iodine, or cataplasms of stramonium, as recommended by Dr. Cunningham, of Arkansas.—(*N. A. Med. and Surg. Jour.*, vol. v.) He adds also, that he has cured several cases of splenitis by Fowler's mineral solution.—D.

† On Diseases of the Stomach, &c., p. 412. In other cases, the general health is not much disturbed, though the patients have a sallow appearance; and thus the disease may continue for many years.—ED.

* Andral describes tubercles of the spleen as very rare in adults, but more common in children. They hardly ever occur without presenting themselves also in other parts. He has often noticed them in the spleen of horses; and in monkeys they are said to be even more common than the tubercles to which their lungs are so notoriously liable.—(Anat. Pathol., tom. ii., p. 431.) Besides hydatids, various other kinds of cysts may be formed in the spleen, and chiefly, according to Andral, within its cells. The most simple are small vesicles, full of serum, which are sometimes dispersed very numerously within the spleen. In some instances they are detached from one another; in others, they are in clusters. MM. Andral and Reynaud found them not only in the cells, but also in the veins of the spleen; some of them being loose, while others were connected to the parietes of the cells and vessels by a slender pedicle. Others, again, were contained in the very substance of those parietes. Certain cysts of the spleen are far more complex: Andral has seen a fibro-serous cyst, which was filled with fatty matter, in the midst of which some hairs were observed. In another instance, a serous cyst presented itself, the contents of which resembled honey.—ED.

its utility in the Island of Walcheren, strongly recommends a weak infusion of the leaves of the *arbutus uva ursi*, which operates beneficially both as a tonic and a diuretic.—(*Med. and Phys. Journ., ut suprà.*) An attack of epistaxis, or an appearance of moisture upon the skin, is generally a sign of returning health.

[For an enlargement of the spleen, accompanied with the state of the constitution described by Dr. Vetch, or anhæmia, Professor Tomassini has found preparations of iron the best medicines. "It is now generally admitted," says Dr. Abercrombie, "that mercury is uniformly and highly injurious, producing mortification of the mouth and rapid failure of the strength. In the earlier stages, when there is any considerable degree of tenderness, repeated topical bleeding should be employed, followed by blistering or a seton. In other respects, the chief reliance of those who have seen most of the disease, appears to be upon free and continued purging, and especially purgatives combined with tonics. The spleen powder and spleen mixture of Bengal are combinations of rhubarb, jalap, scammony, and cream of tartar, with columbo powder and sulphate of iron. About 20 days are stated by Mr. Twining (*Calcutta Trans.*, vol. iii.), as the period which is generally required for reducing by this treatment a very considerable tumefaction of the spleen, if the case has been recent. Others employ nitric acid with aloetic purges. "The natives of India employ the actual cautery, and a combination of aloes, garlic, and vinegar. They also employ aloes, combined with sulphate of iron. It is probable the external use of iodine might be useful."—(*Abercrombie on the Stomach, Liver*, &c., p. 412, ed. 2.)]

In TURGESCENCE of the SPLEEN, whether originating from the preceding, or produced by a strumous diathesis, the organ sometimes assumes a scirrhous hardness; and, in consequence of this symptom, is often felt more distinctly than in the first variety. It acquires, in some instances, a very large size, though often not so large as the turgescent spleen without scirrhus. Sauvages quotes from Bonet a case, in which, after death, it was found to weigh thirty-three pounds, and to fill the whole of the abdomen. The complaint had lasted seventeen years before the patient died, during nearly the whole of which time she pursued her usual avocations.—(Class x., Ord. ii., *Bonet. ex Hypol. Bosco.*) Dr. Baillie has given other singular examples; in one of which the spleen was three times its ordinary size, of a hard, but uniformly solid texture; not tuberculated, nor disposed to suppurate.—(*Morb. Anat., Fascic.* vi. Pl. iii.) When suppuration, however, takes place, the abscess is sometimes very bulky; and the quantity of pus lodged in it has amounted to fifteen pints.—(*Hist. de l'Acad. des Sciences*, 1753, p. 196.)

The coats of the spleen are occasionally converted into a soft CARTILAGE, and exhibit a change which is rarely, if at all, found in other viscera. The enlargement in this case, beyond the natural size of the organ, is in general but trifling; and Dr Baillie records an instance in which there was a diminution of size; the coats, though sometimes evincing irregularities on the surface, are usually smooth and uniform; and it is by these characters that we can alone judge of the nature of the disease during life. [Littre and Morgagni have seen the peritoneal investment of the spleen partially ossified, and Andral* met with one case, in which this organ was merely an osseous shell, with internal bony partitions, between which there was a small quantity of reddish fluid, resembling turbid wine.—(*Anat. Pathol.*, tom. ii., p. 433.)]

With regard to the treatment of scirrhous spleen, it is not necessary to add to the remarks already offered under the preceding species.

[The whole substance of the spleen is sometimes reduced to a soft mass of a dark colour, resembling a mass of coagulated venous blood, and breaking down under the slightest pressure after its peritoneal coat is laid open. In certain cases it is still softer, and of a pultaceous consistence, or even like a reddish mucus or pus. This change of the spleen is chiefly met with in old persons, or such as have passed the age of forty. Its exact cause is not known; but it has been met with in persons who died with scurvy, or of continued or intermittent fevers; or who had been afflicted with melancholy; had experienced violent pain in the hypochondria and epigastric region; or had had symptoms of melæna; or laboured under ascites. Dr. Abercrombie† suspects, that it arises from inflam-

* In Hecker's *Litterarische Annalen*, Dr. Hackmann has presented his views on spleno-malacia, or softening of the spleen, which has frequently attended epidemic fevers in the north of Germany. Dr. Hackmann thinks that softening of the spleen depends on over-congestion or venous inflammation, which presents two stages, one of irritation or congestion, and one of true softening. The symptoms of the former are fever, vomiting of a clear fluid often mixed with bile, præcordial distress, great lassitude, pains in the limbs, vertigo, and extreme thirst, which, if satisfied, increases the præcordial distress: the abdomen is swelled, soft in the umbilical region, but not tender; pain however is felt when the body is bent and the stomach or spleen is pressed. Pulsation is very sensible in the epigastrium, and as the disease advances, this pulsation extends to the region of the spleen. The stage of softening is shown by the access of typhoid symptoms, and death ensues as in cases of fever, or follows a state of coma resembling apoplexy; this apoplectic state frequently occurs in softening of the spleen. The disease is generally rapid in its progress, and softening may take place in eleven or twelve days; but it is sometimes chronic. In the more severe forms of softening, the spleen bursts spontaneously, without any previous violence, the matter comes into the abdominal cavity, and death speedily ensues. In softening of the spleen, the bulk of this organ is not always much increased, unless the patient have suffered from endemic or remittent fever. Dr. Hackmann mentions eight cases of acute spleno-malacia.—D.

† Edin. Med. Journ., No. 80, p. 2. Andral's reference of this state of the spleen to the condition of the blood in it, has been already noticed; and, in support of his belief, that it does not arise from inflammatory action, he asks whether it ought not

matory action. He has observed it, as the only morbid appearance in some obscure cases, which were fatal, with symptoms referable to the stomach; or frequent vomiting, loss of appetite, tendency to costiveness, &c., the pulse remaining undisturbed.*]

SPECIES III.

PARABYSMA PANCREATICUM.

TURGESCENCE OF THE PANCREAS.

HARD ELONGATED TUMOUR, RUNNING TRANSVERSELY IN THE EPIGASTRIC REGION; DYSPEPSY; GENERAL LANGUOR.

THE following are the chief varieties under which the species shows itself:—

α Coactum. Atonic turgescence.	Chronic induration or enlargement.
β Calculosum. Calculous turgescence.	Accompanied with calculous concretions.

Diseases of the pancreas occur but rarely. [In many points it resembles the salivary glands, to which it is also analogous in the rarity of its morbid affections. This truth is confirmed by extensive observation, and when the surrounding viscera are found variously altered by disease, the texture of the pancreas often continues quite healthy. To say, however, that this organ is never diseased, would be incorrect.

Inflammation of the pancreas seems to be a rare disease; but several cases of it are recorded by Barbette, Greizel, Tulpius, and Bartholine, where it was found suppurated and gangrenous. Pain, generally referred to the back, but sometimes resembling colic, attended the disorder. In a few cases, there was vomiting; but it does not appear to have been a common symptom. Guido Patin found an immense abscess occupying the whole of the pancreas. Portal met with a similar case in a man, who died suddenly after two or three attacks of vomiting, followed by syncope. The same pathologist found the pancreas gangrenous in a man who died with obscure pain in the abdomen, accompanied by wasting and occasional nausea and diarrhœa. A gentleman mentioned by Dr. Perceval (*Trans. of the King's and Queen's Colleges*, vol ii.), had jaundice and bilious vomiting; a tumour appeared in the epigastrium; his strength failed; blood and fetid pus were discharged by stool; and in three months he died, gradually exhausted. The pancreas was found much enlarged, and contained a considerable abscess. The ductus communis was obliterated by the pressure.*

The pancreas sometimes contains calculi. De Graaf found seven or eight in the pancreas of a man, who had long been liable to vomiting and diarrhœa. In one enlarged pancreas, Portal found twelve calculi, some of which were as large as nuts. In a case seen by Dr. Baillie (*Works by Wardrop*, vol. ii., p. 239), the calculi consisted of carbonate of lime; in some other instances, their composition has been phosphate of lime.

Dissections prove, that the pancreas is sometimes changed in its texture, size, and figure, in consequence of chronic diseases; but the symptoms are so vague and uncertain, that those which might serve for discrimination, have not yet been pointed out by the most intelligent physicians. No doubt the chief causes of this difficulty depend upon the deep situation of the pancreas, its inconsiderable size, its little sensibility, and the very important organs by which it is surrounded. The valuable researches of Dr. Abercrombie show the remarkable diversity of symptoms in chronic diseases of the pancreas. Of twenty-seven cases, which he found described by various writers, six were fatal, with gradual wasting and obscure dyspeptic complaints, without any urgent symptoms. In eight there was frequent vomiting, with more or less pain in the epigastric region; and thirteen were fatal, with long-continued pain with-

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rather to be considered as an emblem of a general change in the whole mass of blood? Hence its common occurrence in scurvy and typhoid fevers. M. Baillie noticed it in the pernicious intermittents of the Campagna of Rome. What, inquires M. Andral, is the cause of these fevers? Is it splenitis? Or rather, is it not the poison of a miasm, which, by changing the mass of blood, must also modify that which is contained in the spleen?—ED.

* All the diseases of the spleen which have fallen under the observation of Cruveilhier, have exhibited a character of remission, or intermission; a circumstance which he refers to the remission, or intermission, in the functions of this organ. "If," says he, "on the first accession of intermittent fever, it may be questionable whether the spleen has any concern with the disorder, no doubt can exist at a more advanced period. I have attended many of these cases, where each febrile attack was marked not only by the patient's sense of oppression, swelling, and even pain in the spleen, but by an enlargement of it, very manifest to the physician." According to this distinguished pathologist, the induration of the spleen is always accompanied by an increase of its size and specific gravity, and various degrees of fragility, which eventually subside, and are followed by a state of cohesion and compactness, that he has never noticed in any other tissue, excepting the fibrous transformation. In the *ramollissement*, or softening disease, the spleen never becomes so large as when it is indurated; it is not unusual to meet with it above thrice its natural size, though occasionally, in the softened state, it has weighed seven or eight pounds. As for organic diseases of the spleen, such as tubercles, the black degeneration of it, cartilaginous transformation, scirrhus, &c., they are completely irremediable. The same remark applies to collections of hydatids, as far as medicine is concerned; for the only chance of relief must here depend upon their being voided externally, or through some communication formed with the alimentary canal.—ED.

* Abercrombie, Edin. Med. Journ., No. 79, and Pract. Researches on Dis. of the, Stomach, &c., p. 418, ed. 2. A case in which, on examination after death, the pancreas was found in a state of active inflammation, has been recorded by Mr. Lawrence.—See Med. Chir. Trans., vol. xvi, p. 367.

out vomiting. In some of these, the pain extended to the back; and in others it was very much increased by taking food. In several of the cases, there were dropsical symptoms; and, in three or four, there was jaundice, from the tumour compressing the biliary ducts. In the morbid appearances also there was great variety, the pancreas being in many of the cases much enlarged; in others in a state of scirrhous hardness, with very little enlargement. No distinct relation could be traced between the urgency of the symptoms and the degree of enlargement, which was very considerable in some examples in which the symptoms were slight and obscure; while hardness, with little or no enlargement, was noticed in some other cases, where the symptoms were defined and violent.]

Of the diseases appertaining to the present species, Dr. Baillie never met with more, than the modifications specified at the commencement of this section.

All the ordinary causes that produce ATONY in the liver and spleen may affect the pancreas; but there is one that is peculiar to itself, and that is, an habitual excitement of the excretories of this organ by the daily use of tobacco, whether chewed or smoked, probably from a sympathetic action between the pancreatic and salivary glands, whose functions so closely co-operate, and whose secretions are so nearly alike. Dr. Darwin relates a case of this kind, which terminated in the death of the patient, who had been for many years a great consumer of tobacco, chewing it all the morning, and smoking it all the afternoon.—(*Zoonom*, Cl. i., Ord. ii., ii. 8.) The substance of the gland is generally hardened, though not determinately scirrhous; and its lobular appearance is preserved.*

[With respect to the treatment of enlargements of the pancreas, general and local bleeding, the exhibition of purgatives, the application of a blister to the epigastrium,* and a course of alterative medicines, especially Plummer's pill, or iodine, afford the best chances of benefit.]

In the calculous variety, the concretions are chiefly, and sometimes altogether, found in the excretory duct of the gland and its branches, which, in consequence, are often very much distended, and occasionally filled with them. They are usually of a white colour and very irregular shape, and by these characters, when discharged by the rectum, may be distinguished from gall-stones. As the duct is less sensible than those of the liver, the kidneys, or the bladder, it is not often that much pain or uneasiness is complained of, even when the passage, upon an examination after death, seems to have been long blocked up, and upon a stretch.

Emetics, and such exercise as gives a general jar to the animal frame, as riding a hard-trotting horse, will contribute towards dislodging the pent-up concretions; and a free use of acids, acidulous drinks, and especially acidulous mineral waters, will have a tendency to dissolve them.†

SPECIES IV.

w PARABYSMA MESENTERICUM. *MESENTERIC TURGESCENCE.*

INDURATED AND IRREGULAR MASS OF TUMOURS BELOW THE STOMACH, YIELDING TO THE PRESSURE OF THE HAND; PALE, BLOATED COUNTENANCE; ATROPHY; THE APPETITE SELDOM DIMINISHED, OFTEN VORACIOUS.

This species shows itself under the following modifications or varieties:—

α Helminthicum. Vermicular turgescence.	Accompanied with hydatids or other worms.
β Strumosum. Scrofulous turgescence.	Accompanied with scrofula; mostly tubercular.
γ Scirrhosum. Scirrhous turgescence.	Accompanied with scirrhus.
δ Sarcomatosum. Sarcomatous turgescence.	Accompanied with fleshy excrescences.
ε Steatomatosum. Steatomatous turgescence.	Accompanied with adipose excrescences.
ζ Fungosum. Fungous turgescence.	Accompanied with fungous excrescences.‡

* Dr. Sewall has published (*New-Eng. Journ. of Med. and Surg.*, vol. ii., p. 22) many interesting remarks on the diseases of the pancreas. Scirrhous and inflammation with its terminations in abscess and ulceration, are the most prominent ones. This organ is sometimes much enlarged, and approaches a state of induration, without any sensible derangement of its organization. This, however, seems to Dr. Sewall to be only the commencement of a process by which the natural structure is lost entirely, and the pancreas becomes truly scirrhous. Dr. S. states further, that the most remarkable indications of an enlarged and scirrhous spleen are pain in the epigastrium, vomiting, and acidity of the stomach. Dr. Valentine Mott, in his reflections on the pulsation in epigastrio, considers this affection as arising, among other causes, from enlargement or disease of the pancreas.—(See *Trans. of the New-York Physico-Medical Society*, vol. i., p. 341.) The late Dr. Warren, of Boston, considers a tumour in epigastrio with a strong pulsation as generally attending a scirrhous condition of this gland. This pulsation has not been much noticed; among those who have recorded it we may mention Baillie, Burns, Monroe, and Francis.—(*Trans. of the N. Y. Phys. Med. Society*, vol. i. p. 349.)—D.

* See Crampton's case, in Trans. of King's and Queen's College, vol. ii., p. 138.

† In some Observations on Diseases of the Pancreas and Duodenum (Med. Chir. Trans., vol. xviii.), Dr. Bright mentions, that, in the only three instances of a discharge of matter like adipocire from the intestines, where he had had an opportunity of opening the bodies after death, there was a scirrhous state of the head of the pancreas, and fungoid ulceration of the duodenum. Yet, on other occasions, he had seen similar states of disease of these organs, in which no such fatty evacuation had been observed.—Ed.

‡ In one case Mr. Wardrop found the mesenteric glands much enlarged, and converted into a soft

These varieties are often complicated by a union of one of them with several others. Thus the strumous modification is sometimes found to have sprouted with fungous caruncles; the sarcomatous evinces a scirrhous or indurated texture; and vermicles are occasionally found in most of them. It is chiefly a disease of infancy, and debility is the proximate cause; but the predisposing causes are numerous. Innutritious food, a chronic and exhausting sickness, invermination, an impure atmosphere, a scrofulous diathesis, may all pave the way. And when the chylopoietic organs are hereby weakened, the weakness will soon extend to the mesenteric glands, which will become tumefied, and exhibit a tubercular or other irregular surface to the feel. The symptoms grow daily more manifest; because, as the lacteals which enter them are now obstructed and impervious to the chyle, the whole frame becomes emaciated, the superincumbent fat and muscles waste away, and the coacervated glands rise towards the surface, occupy their place, and are covered with a meager shrivelled skin alone. And hence, any of the varieties of the present species may become a cause of atrophy or tabes; though both these species may also exist without such effect.

A total obstruction, however, to the course of the chyle from a parabysma of the mesenteric glands, does not often occur, certainly by no means so often as is suspected. Mr. Cruikshank admits it to be "possible that children and grown persons may sometimes have died of such obstruction; but," he adds, "in such enlargement of the glands, if they ever take place, we should meet with the stagnation of the chyle in the first set of lacteals; yet I never saw such stagnation on any occasion whatever: but as stagnation of the lymph from obstructed lymphatic glands of other parts is said to have been seen, it may be possible that the chyle, from the causes mentioned, may sometimes have been prevented from getting into the blood-vessels."—(*Anat. of the Absorbing Vessels*, part i., p. 115.)

That a total obstruction to the course of the chyle does not necessarily follow very great enlargements of the mesenteric glands is certain, because many patients exist under this disease for a considerable number of years, in some instances not less than ten (*Sauv.*, cl. x., ord. ii., ix., 6, § 3); and seem, even at last, to be carried off by hectic fever, or some other cause of irritation, rather than by actual innutrition. In perfect quiet, and freedom from exercise of all kinds, and where the form has acquired its full range of growth, it is astonishing to see how very small a portion of food entering into the system is capable of supporting life; a subject we have already touched upon under *limosis expers*; and hence Morgagni and Dr. Hunter are inclined to believe, that in old people the glands of the mesentery become obliterated; while Ruysch contended that, in the latter part of his life, he lived without his lacteals, and that old people in general do the same.

In most of the varieties before us the tumours are often very bulky and conglobated; and at times composed of, or accompanied with, cysts filled with a limpid fluid. In one instance, related by M. de Sauvages, these amounted to twenty of various sizes; one as large as a child's head, six as large as a man's fist, and the rest equalling hens' and pigeons' eggs. Hence the whole abdomen is in some cases so generally tumefied as to give a semblance of pregnancy, for which the tumefaction has sometimes been mistaken. This is particularly the case with the last variety; and as the appetite, state of the bowels, and bladder are often unaffected, or only affected casually and to appearance capriciously, there is not unfrequently some difficulty in determining between the two. Sometimes the parabysma is peculiarly complicated in its texture, which is glandular, tubercular, scirrhous, and ossific; the glands or tubercles appearing like clusters of walnuts, interspersed with glands of less magnitude, of the size of peas, beans, or filberts; for the origin of which the reader is referred to the remarks under the first species. Dr. Donald Monro gives a case of this kind in a young woman who died of hectic fever in St. George's Hospital in 1771. Upon laying bare the mesenteric glands after death, they were in some places found to resemble spongy carious bones; not consisting of one large firm piece of bone, but of a number of small pieces united by membranes.

The general outline of the medical treatment will run parallel with the plan already laid down for the cure of *parabysma hepaticum*. If worms exist, the course recommended under the genus HELMINTHIA should be carried into effect, according to the kind of worm that discovers itself; a light, nutritious food, substimulant with salt and acid or aromatic condiments, should form the daily repast, with a free exposure to pure air, and such exercise as the patient is best able to take without fatigue. Our chief dependance, however, must be on small doses of mercury; a mercurial plaster with gum ammoniac, large enough to cover the entire seat of disease; or a small portion of mercurial ointment rubbed over the abdomen every night and morning with the friction of the hand, continued for at least half an hour or an hour at each time; in which case the friction will be of almost as much service as the mercury. A salivation is not desirable, for it will only add to the general weakness; and hence whatever preparations are made choice of, they should fall short of producing this effect. The less stimulant and heating of the gum-resins will often also be found serviceable; and especially myrrh, either alone or in combination with the fixed alkalis; and especially with some form of iodine, which, whether used externally as an ointment, or internally in the mode of pills or tincture, has a tendency to afford more relief, and prove a better deobstruent in this species of parabysma than

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medullary pulp. The patient had died of a large fungus hæmatodes of the thigh. In very rare examples they have been found to contain earthy matter.—See Baillie's Works, vol. ii., p. 180.

in any other. The aperients employed should be gentle; and where calomel is not thought advisable from any particular circumstance that may occur, rhubarb alone, or in union with some of the neutral salts, will usually be found the best medicine we can have recourse to.

Yet, it is only in recent and uncomplicated cases that we can fairly hope for success, let our medical plan be what it may. In the scirrhous, sarcomatous, steatomatous, and especially the fungous modifications, and more especially still, where several of these are playing their parts simultaneously, the art of medicine may possibly retard, but can never entirely ward off, the fate that is approaching, with perhaps a slow, unperceived, and insidious, but, at the same time, with a certain and irresistible stealth of footstep.

SPECIES V.

PARABYSMA INTESTINALE.

INTESTINAL TURGESCENCE.

TUMOUR HARD OR CIRCUMSCRIBED, ROUND OR ELONGATED; MOVEABLE UPON THE PRESSURE OF BOTH HANDS; IRREGULAR DEJECTIONS; OBSTINATE VOMITING; PYREXY; AND FOR THE MOST PART EMACIATION.

In this species the coacervation exists in the coats of the intestines, and consequently is moveable with them. Almost always, however, a slight degree of adhesive inflammation takes place, and the tumefied part becomes united to the superincumbent parietes, or to some other part of the intestinal canal; on which account the disease belongs to the present, rather than to the preceding order. It has chiefly occurred under the two following modifications:—

α Conglomeratum. Conglomerate turgescence.	Cohesive and conglomerated.
β Sarcomatosum. Sarcomatous turgescence.	The tumour circumscribed, and of a fleshy feel.

Morgagni relates a striking instance of the FIRST VARIETY in a man subject to hypochondriacal depressions of mind, as well as to a flux of the hemorrhoidal vessels. Upon an abrupt cessation of the hemorrhage, he soon complained of pains in the abdomen, sometimes sudden and transitory, at other times protracted, but never leaving him intervals of perfect ease. Some months afterward a hardness and swelling were noticeable in the belly, which gradually augmented, and from the pain and emaciation, and almost incessant vomiting with which it was accompanied, at length exhausted and destroyed him. The tumour lay manifest to the sight as well as to the touch, of a circular shape, equidistant from the ensiform process and the navel, in its diameter about eight fingers' breadth. On dissection, the ileum and adjoining portion of the jejunum were found retracted upwards, coacervated, and firmly adhesive.—(Op. cit., tom. ii., ep. xxxix., No. 21, 25.)

[Inflammation of the peritoneal coat of the intestinal canal is very often followed by a close and more or less general adhesion of the bowels to one another. These adhesions are sometimes so numerous and intimate, that the intestines form only one mass, being inseparably blended with the substance connecting them together, and making, as it were, a kind of tube winding in the midst of the confused mass.—(See *Meckel's Anat.*, translated by Doane, vol. iii., p. 296.)]

The tumour in the SECOND VARIETY is often of an oblong shape, and lies below the hypochondria, inclining towards the epigastric region, prominent, with unequal hardness. Fantoni relates a case of this kind in a boy of a corpulent make, about ten years of age. It commenced with an excruciating pain in the belly, pyrexy, and vehement vomiting, and was soon followed by a tumour of the above description, but seated on the left side, in size resembling a prolapsed spleen. The patient, worn out by the violence of the symptoms, did not long survive. On dissection, every other part being found healthy, the colon under the stomach and towards the left side, for the length of the palm of the hand, was greatly indurated and distended, with a fleshy, fibrous, and peculiarly-thickened tumour, which contracted the diameter of the gut (*Fantoni, Obs. Med. Select.*, obs. ii.); and if the boy had lived much longer, would, in all probability, have adhered like the last to the surrounding parietes.

From the violence of the symptoms, and the little prospect we have of allaying them, this disease is almost hopeless. It commences with a considerable irritability of the part of the intestinal canal that is affected, and the effusion, growth of new matter, distention, and, where it takes place, adhesion, add daily to the irritable state, augment the pain, and keep up the tendency to vomit, and reject whatever is introduced into the stomach.

There are two indications to be followed up, and but two medicines that offer us any chance of success while holding the indications in view. Our first object should be to allay the irritability, and consequently the pain and sickness, which, after a free loss of blood by cupping, can only be attempted by opium given in large and repeated doses, if necessary, to the amount of ten, twelve, or even fifteen grains a day, if the patient be an adult. Ten and twelve grains a day, for three weeks, without intermission, I have myself prescribed, with great comfort to the patient, and without stupor, or even sleep, the night being passed in a kind of refreshing revery, without a loss of consciousness at any time. The symptoms we thus endeavour to combat not only bring on sure destruction by the exhaustion they produce, but very considerably promote the enlargement of the tumour, and the extent of the adhesions. If we can succeed in keeping these in subjection for a week or two, it is possible that the constitution may be broken in to submit to the new action produced by the change of structure, and the irritability may at length subside.

We should at the same time endeavour to counteract the morbid change of structure, and particularly to arrest its progress; which con-

stitutes our second indication; and this can only be done by mercurial preparations. Small doses of calomel should, for this purpose, be combined with the opium, while mercurial ointment should at the same time be applied, night and morning, to the seat of pain, and persevered in to ptyalism: for the case is urgent, and not a moment is to be lost. The warm-bath may perhaps afford a temporary relief; but no permanent good is to be expected from it. The bowels, however, may often be conveniently refreshed and evacuated by emollient, but at the same time laxative injections. For the rest, the treatment may be conducted as already laid down under the first species.

[In this section too many different diseases are comprehended under the two varieties, and the divisions of the subject should have been more numerous. An advantageous basis for them might have been derived from morbid anatomy, by which the various swellings and indurations of each particular texture of the bowels might have been determined. Thus the origin of the scirrhous alteration of the intestines in their vascular coat and glandulæ muciparæ, and its subsequent extension to the mucous and muscular coats, might have been explained as the foundation of one variety. The thickened state, first of the mucous coat, and then of the peritoneal and muscular, from dysentery, with ulceration of the first-mentioned membrane, being only effects, and not the original disease, did not necessarily require description here. But the thickened folds of the mucous membrane, caused by an accumulation of the cellular substance (*Baillie's Works*, vol. ii., p. 159), might have been enumerated as a variety strictly appertaining to this species.

The remark needs scarcely to be made here, that all organized fleshy indurations, thickenings, tubercles, adhesions, scirrhi, and fungoid swellings of any portion of the alimentary canal, must be deemed beyond the power of medicine.]

SPECIES VI.
PARABYSMA OMENTALE.
TURGESCENCE OF THE OMENTUM.

TUMOUR INDURATED AND DIFFUSED: FREQUENTLY SPREADING OVER THE WHOLE OF THE ABDOMINAL REGION: DYSPNŒA; EMACIATION.

THIS species is especially characterized by its extent and the want of a definitive outline, by which it is particularly distinguished from the preceding. It is usually of a complicated texture; infarcted, scirrhous, tuberculate, and cartilaginous. It has been found of various shapes and magnitudes, from a weight of five pounds to that of twenty, twenty-five, thirty, and, in one instance, fifty-six pounds. In the last case, the patient, a female, appeared to be labouring under an ascites, so generally was the abdomen enlarged. She sunk, gradually worn out by atrophy and pains of various kinds; and on examining the abdomen, the tumour, occupying the entire cavity of the belly, instantly presented itself to view, enclosed in a pretty thick and stout membrane, chiefly adipose, partly scirrhous and glandular, with a cavity in its interior, filled with a sordid and fetid sanies. Laterally and below, it adhered to the surrounding organs only slightly; but was so firmly fixed to the fundus of the stomach and parts adjoining, that it could not be separated without laceration.—(*Greg. Horst.*, prob. x., dec. vi.)

In some instances the hardness has been almost stony (*Panarol.*, pentec. iii., obs. 10), in others osseous (*Mongin, Hist. de l'Acad. des Sciences*, 1732); sometimes loaded with many thousand glandules (*Seger. Ephem. Germ.*); and, in several of these, accompanied with excruciating pains.—(*Hux. Phil. Trans.*, vol. vii.)

Whatever benefit may be expected from medicine, is to be collected from the remarks already offered on the preceding species.

SPECIES VII.
PARABYSMA COMPLICATUM.
COMPLICATED TURGESCENCE.

THE BELLY HARD, ELEVATED, AND DISTENDED AS THOUGH PREGNANT, AND OFTEN SUPPOSED TO BE SO; YET MORE OR LESS KNOTTY AND UNEQUAL: RESPIRATION SELDOM IMPEDED: FOR THE MOST PART ACUTE PAIN, NAUSEA, OBSTINATE VOMITING, AND THIRST.

SEVERAL of the preceding species are complicated as to the nature of the tumour with which the respective organ is affected; the present is complicated as being compounded of various viscera, which are affected simultaneously. And hence the symptoms must often differ in different individuals, according to the immediate seat of the disease and the nature of the tumour. The liver is, in perhaps all cases, more or less concerned: sometimes in connexion with the spleen, sometimes with the mesentery, sometimes with the stomach or intestines, and sometimes with all together. Hildanus found the liver so enlarged as to pass beyond the false ribs of the left side, with the spleen equally enlarged (Cent. ii., obs. 45), and fixed to the adjoining lobe of the former organ. Huldenreich, in a woman of forty-five years of age, found the liver scirrhous, weighing fourteen pounds, with a fleshy excrescence in the mesentery, of the size of a child's head. This case was also further complicated with jaundice.—(*Miscell. Nat. Cur.*, Ann. vi., vii.) Bartholine mentions a woman of elegant form, in the flower of her age, attacked with another modification of this disease, which at length destroyed her: all the intestines, liver, spleen, and every adjoining viscus, were found intermixed, and buried in fat; the liver being at the same time enlarged and scirrhous, and filling both hypochondria; the stomach thickened and cartilaginous.—(Cent. ii., obs. 6.)

Dr. Baron has given various examples of the same, both from earlier writers and from his own practice, of which the following is one of the most illustrative: the patient was a girl of about eighteen, and had laboured under the

malady for several months before it proved fatal. "On opening the belly, it was found that the whole of its contents adhered to each other, and to the cavity, in such a manner as to form apparently one solid mass. None of the viscera could be distinguished till the thickened layers of the peritonæum were torn from their adhesions. It was impossible to do this from the intestines, for there the thickening and adhesions had proceeded so far, as to render any attempt at unfolding them impracticable. The mesentery and its glands were in a very diseased state: the latter were about the size of almonds, and had much of the same appearance when cut into. On separating the peritonæum from its adhesions to the diaphragm, the liver was found of a much larger size than natural; it was of a bright copper-colour, and, like the intestines, it had lost its proper texture. The fingers pierced it in every direction without resistance, and it appeared like a part in a state of incipient putrefaction. On cutting through the right lobe, a lumbricus was observed in one of the biliary tubes."—(*On Tuberculated Accretions*, &c., p. 25, 8vo., 1819.)

Various morbid changes, as adhesions, thickenings, tubercles, granulated masses, ulceration of the bronchial glands, and purulent discharge, were also observed in the thorax: for all the species of parabysma, when at length accompanied with inflammatory action, are peculiarly apt to spread not only from organ to organ, but from cavity to cavity; and more so from the abdomen to the chest, than the chest to the abdomen.

Other cases of a striking character are referred to in the author's Nosological Synopsis, which might be easily augmented if necessary; but the present are sufficient to give a general view of the nature, gigantic features, and mischievous effects of this monstrous race of diseases: diseases which we can rarely hope to conquer, unless we have an opportunity of strangling them in their infancy; though we may sometimes give a check to their rapid strides, palliate their painful progress, and postpone their fatal triumph.

CLASS II.

PNEUMATICA

DISEASES OF THE RESPIRATORY FUNCTION.

ORDER I.

PHONICA.

AFFECTING THE VOCAL AVENUES.

II.

PNEUMONICA.

AFFECTING THE LUNGS, THEIR MEMBRANES OR MOTIVE POWER.

CLASS II.

PHYSIOLOGICAL PROEM.

BEFORE we enter on the dieases which disturb the function of respiration, and constitute our Second Class, it may be found advantageous to take a brief survey of the general nature of this function, and of the organs which form its instruments.

The respiratory function is maintained by a current of air, alternately thrown into and thrown out of the chest, and is subservient to two important purposes: that of furnishing us with speech, or the means of vocally communicating and interchanging our ideas; and that of carrying off from the blood a gas recrementory and deleterious to life, and possibly of introducing in its stead one or more gases indispensable to animal existence. It is these two purposes that lay a foundation for the two Orders, into which the Class before us is divided; the first entitled PHONICA, comprising the diseases affecting the VOCAL AVENUES; and the second, PNEUMONICA, comprising those affecting the LUNGS, THEIR MEMBRANES OR MOTIVE POWER.

I. At the root of the tongue lies a minute semilunar bone, which, from its resemblance to the Greek letter υ or *u-psilon*, is called the *hyoid* or *u-like* bone; and immediately from this bone arises a long, cartilaginous tube, which extends to the lungs, and conveys the air backward and forward, in the manner and for the purposes already mentioned. This tube is denominated the trachea or windpipe; and the upper part of it, or that immediately connected with the hyoid bone, the larynx; and it is this larynx, or upper part, that alone constitutes the seat of the voice.

[The larynx is situated on the median line, and consequently, according to the doctrine of Bichat, it is regular and symmetrical in its form, like all the organs of animal life. Considered as the upper termination of the trachea, it forms a striking contrast with the lower extremity of that tube, which, consisting of the bronchi, and concerned merely with the functions of organic life, is made up of two lateral portions not resembling each other. The lateral portions of the larynx, on the contrary, are exactly similar. This symmetry is necessary for the harmony of its functions; and a discordant voice would inevitably result from different organizations of the two halves of it, or from inequality in the powers of the muscles of its right and left sides.]

The tube of the larynx, short as it is, consists of five cartilages; the largest, and apparently, though not really, lowermost of which produces that acute projection, or knot in the anterior part of the neck, and especially in the neck of males, of which every one must be sensible, and which was formerly denominated pomum Adami, as though it had sprung up in consequence of Adam's having eaten the forbidden fruit. This is not a complete ring, but is open behind, the open space being filled up, in order to make a complete ring, with two other cartilages of a smaller size and power; and which, together, form the glottis, as it is called, or immediate aperture out of the mouth into the larynx. Of these three cartilages, the first is named scutiform, or shield-shaped; the other two, arytenoid, or funnel-shaped. A fourth cartilage lies immediately over this aperture, and closes it in the act of swallowing, so as to direct the food to the œsophagus. From its position it is called epiglottis. These four cartilages are supported by a fifth, which constitutes their basis, is narrow before, and broad behind, and has some resemblance to a seal-ring: on which account it is named cricoid, or annular. [It is situated between the two flat plates composing the thyroid or scutiform cartilage; and, upon its elevated posterior margin, the two little arytenoid cartilages are loosely articulated, so as to admit of free motion. The chordæ vocales are the two long edges of the rima glottidis, which meet together in front. They consist of a peculiar elastic substance, and reach

from the forepart of the arytenoid cartilages to the thyroid cartilage. Hence, the size of the rima glottidis must necessarily be altered by every movement of the arytenoid cartilages. In the instrument of the human voice, the chordæ vocales are analogous to the various contrivances for producing vibration in musical wind-instruments.] The larynx is contracted and dilated in a variety of ways by the antagonist powers of different muscles, and the elasticity of its cartilaginous coats: and is covered internally with a very sensible, vascular, and mucous membrane, which is a continuation of the membrane of the mouth.

The form of the glottis, composed of three distinct cartilages, resembles that of a small box, with a minute aperture or rima. In adults this aperture is about ten or eleven lines in length, and two in breadth at its greatest diameter. It is, however, increased or diminished by the action of the arytenoid and cricoid cartilages: and in birds and amphibials, is capable of being so completely closed as to prevent the smallest drop of water from penetrating it, except with the will. In this way frogs confine the air in the lungs, and live without inspiration for considerable time.

[That the larynx is the primary organ, in which the original sound is produced, is proved by the voice being destroyed or modified by certain diseases and accidents. If an opening be made in the trachea below the larynx, so that no air shall pass through the latter, no voice is produced; when, on the contrary, an opening is made immediately above the glottis, the voice is not affected. In Bichat's experiments, when the epiglottis was confined, or even cut away, the voice was not affected by it; though later observations tend to prove, that it really answers a particular purpose in the vocal apparatus, as will be presently specified. When the same eminent physiologist cut through the arytenoid cartilages, or divided the thyroid longitudinally, he found that the voice was annihilated.]

The organ of the voice, then, is the larynx, its muscles and other appendages; and the voice itself is the sound of the air propelled through, and striking against the sides of the glottis or aperture into the mouth. The shrillness or roughness of the voice depends on the internal diameter of the glottis, its elasticity, mobility, and lubricity, and the force with which the air is protruded. Speech is the modification of the voice into distinct articulations in the cavity of the glottis itself, or in that of the mouth or of the nostrils.

There is a difficulty, however, in determining by what means the air is rendered sonorous in the glottis, and various explanations have been offered upon the subject. The oldest is that of Galen, who supposed the calibre of the glottis to be alternately expanded and contracted; an idea revived in modern times by Dodart, who at the same time compares its action to that of a flute.—(*Mém. de l'Académie*, &c., 1700.) A second explanation is that of M. Ferrein, who supposes the variations of sound to depend upon variations of tension and relaxation in the ligaments of the glottis; and, in this view, such ligaments become vibrating chords, and the entire apparatus approaches the nature of a violin.—(Id., 1741.) A third explanation is that of M. Richerand, who unites the two preceding conjectures, and supposes that the glottis is a wind and a chord instrument at the same time. To these explanations we may add that of Kratzenstein, who regards the glottis, in conjunction with the whole length of the larynx, as a kind of drum (*Tentamen de Natura et Charactere Sonorum Literarum Vocalium*, 4to., 1781); and that of M. Blumenbach, who views the former in the light of an Æolian harp.—(*Instit.*, sect. ix., x., subsect. 155.)

[Perhaps the organ of the human voice is more correctly compared to a clarinet. The rima glottidis is the mouth-piece of the larynx, and corresponds with the reed in the clarinet, or with the lips of a player upon the flute. In pursuing the same simile, as Mr. Mayo has remarked (*Outlines of Human Physiology*, p. 333), we look for a contrivance, analogous to the stops in the flute or clarinet, by means of which the tube may be shortened or lengthened, and we find the effect produced by the alternate rising and falling of the larynx. When the larynx is raised, the vocal tube is shortened; when it is depressed, the vocal tube is lengthened.

In forming high, or acute sounds, a contracted state of the glottis, with tension of its ligaments, is required; the air passes rapidly through the narrow opening, and numerous oscillations of its sides are produced. The whole larynx is carried upwards and forwards; and, when the most acute sounds are uttered, the head is thrown backward, in order that the larynx may be elevated through a wider range. This elevation equals nearly half an inch for one octave. That the changes above mentioned take place is proved, by placing the finger on the larynx, and uttering an acute sound, at which period the ascent of the organ may be plainly felt; by the comparatively acute voice of children and women, in whom the larynx is small, and the glottis consequently narrow; by comparative anatomy, which shows us, that the glottis is small and narrow in singing birds; large and relaxed in animals which utter deep sounds; by the blowing of wind instruments, in which the opening for the passage of the air is always contracted in order to produce the high notes; and also by this general fact, that the sounds are always more acute in proportion as these instruments are of smaller size.

In the production of deep or base tones, an opposite state of parts is required: the larynx is carried downwards, and the head itself brought towards the chest. This descent, like the ascent, is about half an inch for an octave. In the male sex, where the larynx is larger, and the glottis consequently more ample than in the female, the voice has habitually a deeper tone. Eunuchs and women may be taught to sing soprano, but not base. When very low tones are formed, in which the chordæ vocales

are greatly relaxed, the production of sound ceases altogether. A human voice that has been much exercised, can pass through about two octaves and a half in either direction from the middle; consequently, it has a range in the neck of nearly three inches. The minuteness of the change, capable of altering the tone, must seem truly wonderful, when we reflect, that the breadth of the rima glottidis does not exceed a line at its broadest part, and that the variety of tones is almost endless.—(See *Art. Larynx in Rees's Cyclopædia.*)

The force with which the air is impelled into the flute, the clarinet, or the larynx, is regulated by the action of the muscles of the chest concerned in expiration.

According to M. Magendie, one use of the epiglottis is to perfect the larynx as a musical instrument. The note of a clarinet, swelled beyond a certain degree of loudness, is apt to break into a higher note; now, M. Grenié discovered, that this imperfection may be remedied by the insertion of a tongue of elastic substance; and, in the organ of the human voice, the epiglottis is precisely such a contrivance.

That much difficulty, however, attends all the foregoing theories, cannot be denied: this is rendered clear enough in a memoir by M. Savart (*Magendie, Journ. de Physiol.*, tom. v., 369), who shows that the analogy between musical instruments and the organ of voice is very imperfect.]

Those animals only that possess lungs, possess a larynx; and hence, none but the three first classes in the Linnæan system, consisting of mammals, birds, and amphibials. Even among these, however, some genera or species are entirely dumb, as the myrmecophaga, or ant-eater; the manis, or pangolin; and the cetaceous tribes; the tortoise, lizards, and serpents; while others lose their voice in particular regions; as the dog is said to do in some parts of America, and quails and frogs in various districts of Siberia.*

It is from the greater or less degree of perfection with which the larynx is formed in the classes of animals that possess it, that the voice is rendered more or less perfect: and it is by an introduction of superadded membranes, or muscles, into its general structure, or a variation in the shape, position, or elasticity of those that are most common to it, that quadrupeds and other animals are capable of making those peculiar sounds by which their different kinds are respectively characterized; and are able to neigh, bray, bark, or roar; to pur, as the cat and tiger kind; to bleat, as the sheep; or to croak, as the frog; which last, however, has a sac or bag, of a singular character, in the throat or cheek, directly communicating with the larynx, on which their croaking principally depends.

The larynx of the bird class is of a very peculiar kind, and admirably adapted to that sweet and varied music, with which we are so often delighted in the woodlands. In reality, the whole extent of the trachea in birds may be regarded as one vocal apparatus; for the larynx is divided into two sections, or may rather, perhaps, be considered as two distinct organs, the more complicated, or that in which the parts are more numerous and elaborate, being placed at the bottom of the trachea, where it diverges into two branches or bronchiæ, one for each of the lungs: and the simpler, or that in which the parts are fewer, and consists of those not included in the former, occupying its usual situation, at the upper end of the trachea; which, however, is still without an epiglottis; both food and water being, as we have already observed, rendered incapable of penetrating the aperture of the glottis, by another contrivance. The lungs, trachea, and larynx of birds, therefore, may be regarded as forming a complete natural bagpipe; in which the lungs constitute the pouch and supply the wind; the trachea itself, the pipe; the inferior glottis the reed or mouthpiece which protrudes the simple sound; and the superior glottis, the fingerholes which modify the simple sound into an infinite variety of distinct notes, and at the same time give them utterance.

Here, however, as among quadrupeds, we meet with a considerable diversity in the structure of the vocal apparatus, and especially in the length and diameter of the tube or trachea, not only in the different species, but often in the different sexes of the same species, more particularly among aquatic birds. Thus the trachea is straight in the tame or dumb swan (*anas olor*) of both sexes; whilst in the male musical swan (*anas cygnus*), but not in the female, it winds into a large convolution, contained in the hollow of the sternum. In the spoonbill (*platalea leucorodia*), as also in the mot-mot pheasant (*phasianus mot-mot*), and some others, similar windings of the trachea occur, not enclosed in the sternum. The males of the duck and merganser (*anas* and *mergus*) have, at their inferior larynx, a bony addition to the cavity, which contributes to strengthen their voice.

Among singing-birds, Mr. Hunter, who, at the request of Mr. Pennant, dissected the larynx of many distinct kinds, observes that the loudest songsters have the strongest muscles, and that the skylark has the strongest of the whole; his clear and vigorous note is often heard when he can no longer be followed in his ascent by the most penetrating eye. He observes also that, among this division of birds, the muscles of the male, following the same rule, are stronger than those of its respective female, whose voice is always less powerful. In birds that have no natural voice, he perceived no difference of muscular power in the larynx of either sex.

From this more extensive and complicated machinery in the vocal organ of birds, we find numerous species possessing powers of a very extraordinary kind. In many of them, as the thrush and the nightingale, the natural song is exquisitely varied, and through an astonishing length of scale. In the *pipra musica*, or tuneful manakin, the song is not only intrinsically sweet, but forms a complete octave; one note

* Blumenb. Comp. Anat., ch. xv., § 193. Camper. Phil. Trans., vol. lxix., 1779, p. 139.

succeeding another, in ascending and measured intervals, through the whole range of its diapason. There are various kinds that can imitate the music of human art, and amuse us by acquiring national and popular tunes; as the bullfinch, the linnet, and even the robbin, when reared in a state of separation from all other birds; whilst some, again, are capable of imitating human speech, as the parrot, the jay, and jackdaw, and, indeed, most of the psittacus and corvus genera; a fact, which proves the possession of a powerful and retentive memory, as well as of a precise and delicate ear. A linnet, according to Mr. Pennant, was once taught the same at Kensington; and even the nightingale is said to have talents for speaking equal to those for singing. But where is the man, whose bosom burns with a single spark of the love of nature, who could for a moment consent, that this sweet songster of the groves should barter away the touching wildness of its native notes for any thing that art has to bestow?

Yet, perhaps, there is no species among the class of birds that is more entitled to notice in a physiological survey, on account of its voice, than the *turdus polyglottus*, or mocking-bird. This is a subdivision of the thrush kind; its own natural note is delightfully musical and solemn; but, beyond this, it possesses an instinctive talent of imitating the note of every other kind of singing-bird, and even the voice of every bird of prey, so exactly as to deceive the very kinds it attempts to mock. It is moreover playful enough to find amusement in the deception; and takes a pleasure in decoying smaller birds near it by mimicking their notes, when it frightens them almost to death, or drives them away with all speed, by pouring upon them the screams of such birds of prey as they most dread.

Now it is clear that the imitative, like the natural voice, has its seat in the cartilages and other moveable powers that form the larynx; for the great body of the trachea only gives measure to the sound, and renders it more or less copious in proportion to its volume. It is not therefore to be wondered at, that a similar sort of imitative power should be sometimes cultivated with success in the human larynx; and that we should occasionally meet with persons who, from long and dexterous practice, are able to copy the notes of almost all the singing-birds of the woods; or the sounds of other animals; and even to personate the different voices of orators and other public speakers.

One of the most extraordinary instances of this last kind, consists in the art of what is called VENTRILOQUISM, of which no very plausible explanation has hitherto been offered to the world. The practitioner of this occult art is well known to have a power of modifying his voice in such a manner as to imitate the voices of different persons conversing at some distance from each other, and in very different tones. And hence, the first impression which this ingenious trick or exhibition produced on the world, was that of the artist's possessing a double or triple larynx, the additional larynges being supposed to be seated still deeper in the chest than the lowermost of the two that belong to birds; whence, indeed, the name of VENTRILOQUISM, or BELLY-SPEAKING. This rude and early idea M. Richerand was at one time strongly tempted to revive; but a closer examination of the subject convinced him that it could not be supported, and he abandoned it, without, however, offering any other sufficiently matured for examination. Mr. Gough has attempted, in the Memoirs of the Manchester Society, to resolve the whole into the phenomena of echoes; the ventriloquist, on this hypothesis, being conceived to confine himself on all occasions to a room well disposed for echoes in various parts of it, and merely to produce false voices by directing his natural voice in a straight line towards such echoing parts, instead of in a straight line towards the audience; who, upon this view of the subject, are supposed to be artfully placed on one or both sides of the ventriloquist. It is sufficient, in opposition to this conjecture, to observe, that it does not account for the perfect quiescence of the mouth and cheeks of the performer while employing his feigned voices; and that an adept in the art, like M. Fitzjames, who exhibited a few years ago in our own country, or M. Alexandre of the present day, is totally indifferent to the room in which he practises, and will readily allow another person to choose a room for him. Of M. Fitzjames, M. Richerand has given a particular account from personal examination. He observes, that he always made a strong inspiration before he commenced his performance, and could support his various voices till he required a fresh supply of air; thus evidently proving that the inhaled air was expired, though not through the lips, but, as appears from another case, observed by M. Richerand, at least partly through the nostrils.

Yet the means by which the ventriloquist is enabled to modify his articulations into the semblance of distinct voices, still remains to be explained; and I shall hence beg leave to throw out a suggestion upon the subject. From various concurrent facts, ventriloquism appears to be an imitative art, founded on a close attention to the almost infinite variety of tones, articulations, and inflexions which the glottis is capable of producing in its own region alone, when long and dexterously practised upon; and a skilful modification of these vocal sounds, thus limited to the glottis, into mimic speech, passed for the most part, and whenever necessary, through the cavity of the nostrils, instead of through the mouth. It is possible, however, though no opportunity has hitherto occurred of proving the fact by dissection, that those who learn this art with facility, and carry it to perfection, possess some peculiarity in the structure of the glottis, and particularly in respect to its muscles or cartilages.

In singing, every one knows that the glottis is the only organ made use of, except where the tones are not merely uttered but articulated. It is the only organ employed, as already observed, in the mock articulations of parrots, and other imitative birds; it is the only organ of

natural cries, constituting the language of all animals possessing a voice; and hence Lord Monboddo has ingeniously conjectured, that it is the chief organ of articulate language in its rudest and most barbarous style. "As all natural cries," says he, "even though modulated by music, are from the throat and larynx, or knot of the throat, *with little or no operation of the organs of the mouth*, it is natural to suppose, that the first languages were, for the greater part, *spoken from the throat;* and that what consonants were used to vary the cries, were mostly *guttural*, and that the organs of the mouth would at first be but very little employed."—(*Orig. and Prog. of Lang.*, vol. i., b. iii., ch. 4.) To which I may add, that notwithstanding, in the ordinary use of speech, the tongue takes an auxiliary part among mankind, yet the numerous and well-authenticated examples on record, and to which we shall have occasion to advert more minutely hereafter, of persons who have retained a full and perfect command of speech, after the tongue has been destroyed or extirpated, proves, incontrovertibly, that the glottis alone is capable of supplying, in this respect, the place of the tongue, upon particular occasions, and where perhaps peculiar pains are taken to call forth the full extent of its latent powers.

This explanation, which some hundreds of persons in this metropolis may remember to have been advanced by the author, in a public lecture on the subject, delivered in the year 1811, has since been embraced in France, though without adopting the hint, that the full perfection of the art may possibly depend upon some slight addition to the muscular organism of the glottis, in those who are thus highly endowed with it. And hence M. Magendie asserts, that ventriloquism consists in nothing more than a delicate attention to the different effects or modifications of sounds or speech, thrown at different distances and through different modes of conveyance, and an exact imitation of them in a larynx of common formation and powers.

"Les fondemens sur lesquels répose cet art sont faciles à saisir. Nous avons instinctivement reconnu, par l'expérience, que les sons s'altérent par plusieurs causes; par exemple, qu'ils s'affoiblissent, deviennent moins distincts, et changent de timbre à mesure qu'ils s'eloignent de nous. Un homme est descendu au fond d'un puits; il veut parler aux personnes qui sont à l'ouverture: sa voix n'arrivera à leur oreille qu'avec des modifications dépendantes de la distance, de la forme du canal qu'elle a parcouru. Si donc une personne remarque bien ces modifications, et s'exerce à les reproduire, il produira des illusions d'acoustique, dont on ne pourra plus se défendre, qu'on ne peut pas voir les objets plus gros lorsqu'on les regarde à travers un verre grossissant; l'erreur sera complète s'il emploie d'ailleurs les prestiges convenables pour détourner l'attention.

"Plus l'artiste aura de talens, plus les illusions seront nombreuses: mais il faut se garder de croire qu'un ventriloque produise les sons vocaux, et articule autrement qu'une autre personne. Sa voix se forme à la manière ordinaire. Sous un certain rapport, on peut dire que cet art est à l'oreille ce que la peinture est pour les yeux."—(*Physiologie*, tom. ii., p. 235.)

But this last view of an ordinary articulation and formation of the voice, is at variance with that perfect quiescence of the muscles of the cheeks and lips which the more skilful ventriloquists evince, and which can only be accounted for by a formation of articulations, and not merely a modification of sounds in the larynx.

II. The lungs, whose vessels receive the air from the trachea, and in which the blood undergoes the important process of ventilation, are well known as a pair of large, light, elastic, and spongy organs, suspended by the tracheal tubes and large bloodvessels in the cavity of the chest, and in size adapted to the two sacs of the pleura, which they completely fill when inflated. They are surrounded by an exquisitely fine duplicature of this delicate membrane, which lines the entire cavity of the thorax, and separates the lungs from each other by a process or septum; which from its running between the two, is called mediastinum. [The same points of the two layers of the pleura are not always applied to each other; for when the lung expands, it slides upon the pleura costalis (*Mayo's Outlines*, p. 85); a fact proved by the elongation of the adhesions, so frequently existing between the lungs and inside of the chest.] The substance of the lungs is lobular; the larger lobes dividing into smaller, and the subdivision being continued through an almost infinite series, till the ultimate lobules terminate in very minute vesicles; which, after birth, though not antecedently, are filled with air, conveyed by an innumerable host of exquisitely slender ramifications from the two grand branches into which the trachea at first forks off, so as to form a main division for each of the lungs, and which are denominated bronchiæ, as their subdivisions are bronchial vessels. The vesicles or air-cells are invested and held in connexion by the mucous web, common to all animal organs, which, at the same time that it unites them and forms their boundaries, opens a communication between the one and the other, and is itself freely supplied with exquisitely fine bloodvessels, that are ramifications from the pulmonary artery, and continue to divide and subdivide, till they at length form a beautiful network upon the sides of the air-cells, and ultimately become invisible from their attenuation; by which means every particle of blood is exposed, in its turn, to the full benefit, whatever this may consist in, of the gases of the atmosphere, contained in the air-cells which they thus surround.

[Magendie found the air-cells smaller in infants than adults, and less in adults than in persons of advanced age. It further appears that, as we grow older, the specific gravity of the lungs diminishes; and so remarkable is this change, that a piece of lung taken from a man sixty years of age, was fourteen times lighter than a portion of lung of equal size taken from a child.—(*Journ. de Phys. Expér.*, t. i., p. 78–80.)

This increase in the size of the air-cells is

generally so regular, that the age of the subject may be determined by it. However, in old persons, who retain their *embonpoint*, whose muscles are large, and whose hearts are necessarily of considerable size, the air-cells do not undergo such an increase of dimensions. But the contrary happens in very thin old persons of broken constitutions, in whom the heart is almost always diminutive, and the quantity of blood scanty.

The size of the air-cells is also modified by disease. In individuals who have coughed a great deal previously to death, they are generally larger. When such persons are aged, the air-cells may be even two lines in diameter, without any vestige of laceration. The healthy lung of certain individuals affected with phthisis on one side only, was found, when inflated and dried, to resemble light froth.

The preceding change in the texture of the lungs with the progress of age, has the effect of really lessening the number of capillary vessels, by which the blood from the right ventricle is transmitted into the pulmonary veins. In other words, the surface by which the venous is converted into arterial blood, and from which pulmonary exhalation takes place, is thereby diminished. The only remedy for this imperfection would be a quicker pulse, in order that as much blood might be sent in a given time through the lungs of an old, as through those of an adult subject. But unfortunately, as Magendie has observed, the heart beats more slowly in the aged than in other individuals. From these facts it seems probable that the old person must consume less oxygen than the young; that his animal heat must be less; and his ability to resist cold very inferior.]

The moving powers of the lungs consist in the bones, cartilages, and muscles by which they are encircled. The bones are the ribs and sternum, which, in their form, insertion, and general freedom of play (for even the sternum itself seems to yield a little), exhibit a perfection of art that the most careless among us cannot but admire, though the wisest could not have contrived:

"Deus, Deus, ille, Menalca!

Antecedently to birth, the whole of this machinery, with the bloodvessels, may be contemplated as at rest, and the lungs in a state of collapse, in whose interstices there is a perfect vacuum. From the moment the infant becomes exposed to the atmosphere, the air, which presses forcibly on every side, presses also upon the upper part of the trachea through the channels of the mouth and the nostrils; the motive powers of expansion, and which are afterward those of expiration, are immediately stimulated into action; the ribs rise by the agency of the intercostal muscles, and the chest becomes elevated; the diaphragm, whose broad and muscular septum divides the thorax from the abdomen, sinks, from instinctive sympathy, towards the viscera beneath, and the chest becomes deepened; and into the dilated vacuum, hereby produced, the external air rushes forcibly by the trachea, and, by inflating the lungs to the full stretch of their elasticity, compresses all the surrounding organs. Yet, as the force with which the air operates is very considerably less than that of the heart when stimulated to contract, the blood, instead of being hereby impeded in its course through the pulmonary vessels, flows far more freely, and dilates these vessels by its plenitude, as they are already necessarily elongated by the expansion of the lungs; and the heart in this manner becomes liberated from a load which, if it were to remain in its cavity, would oppress it, and put a stop to its action. And hence we behold at once the important connexion that exists between the sanguiferous and the respiratory systems, and how much the soundness of the one must depend upon that of the other.

Such, then, are the chief motive powers concerned in the act of inspiration, and the means by which they effect their purpose. The process of expiration, or that of throwing the air back again after it has accomplished its intention, is not of more difficult comprehension. [The muscular contraction of the diaphragm and intercostals having ceased, is succeeded by a short relaxation, the elasticity of the cartilages of the ribs and texture of the lungs, occasionally aided by the muscles of the belly and loins, reduces the chest to its former dimensions; and as the capacity of the lungs is thus diminished, some of the air in them is expelled. In a little while the contraction of the diaphragm and intercostals is renewed, and is again followed by relaxation; this alternative proceeding as long as life continues.]

Now this is precisely the state of the moving powers of the lungs, in the two alternate actions of inspiration and expiration. For while the muscles we have just adverted to are stimulated to expand the chest, there are others that, by a reverse energy, are perpetually striving to contract its diameter. Almost all the abdominal muscles tend to produce this effect, and particularly the oblique, straight, and transverse. Many of these are inserted into the ribs; and, as the latter become elevated, endeavour to draw them back into their anterior situations, to which also the ribs themselves have an inherent inclination to return, from their natural elasticity. Other muscles, urged into action by the descent of the diaphragm, immediately contract their fibres, diminish the convexity of the abdomen, and hereby force the abdominal viscera upwards and backwards against the diaphragm that thus intrudes upon them, and drive it into its former position; while all the bloodvessels, and even the air-cells of the lungs, possessing an elastic power, have a natural tendency to return to their smaller diameters; and hence expiration is performed with even more facility than inspiration, and is consequently the last action of dying persons.

The most important power in the act of expiration is, unquestionably, the diaphragm; and on this account Dr. Carson, omitting all consideration of its auxiliary muscles, regards this as the sole antagonist to the expansive energy of

the lungs. "Two powers," says he, "are therefore concerned in regulating the movements, and in varying the dimensions and form of the diaphragm,—the elasticity of the lungs, and the contractile power of the muscular fibres of the diaphragm. Of these powers, the one is permanent and equable; the other variable, and exerted at intervals. The contractile power of the diaphragm, when fully exerted, is evidently much stronger than its antagonist, the resilience of the lungs; but the latter not being subject to exhaustion, takes advantage of the necessary relaxations of the former, and, rebounding like the stone of Sisyphus, recovers its lost ground, and renews the toil of its more powerful opponent." This is a correct statement, so far as it goes; but the collateral powers, called into action in the expulsion of the air from the lungs, should not be overlooked in a general outline of the entire economy of respiration. In effect they are slightly hinted at, though not described, in the passage which immediately follows, in which we are told that "breathing is *in a great measure* the effect of this admirable contest between the elasticity of the lungs and the irritability of the diaphragm."*

[In ordinary breathing, expiration is conceived by some physiologists to be, in a great measure, a passive operation, depending principally upon the elasticity and other physical properties of the organs concerned. This, however, is supposed to be the case only in the quiescent easy state of respiration, without exertion. Though the function cannot be altogether suspended by any voluntary effort, the degree in which it is carried on may be influenced and altered by the will. Thus, as Dr. Bostock notices, when we wish to make a full inspiration, we call into action, besides the diaphragm and intercostals, the external muscles of the breast, shoulders, and other neighbouring parts, which, by elevating the ribs and the sternum, increase still further the capacity of the chest. When, on the contrary, we wish to produce a full expiration, the abdominal muscles contract, the viscera are pushed up against the diaphragm, and its convexity towards the thorax is augmented.—(*Bostock's Physiol.*, vol. ii., p. 8.)]

The powers I have thus far noticed, are those which usually act without the interposition of the will, although the will possesses some control over most of them. But whenever this faculty of the mind co-operates and throws its influence into the balance on either side, other powers are sometimes called into action, and the energy of some of these is occasionally suspended. Thus, in the case of a fractured rib, or of pleurisy, the power of the will keeps the ribs quiescent, and the power of expansion is thrown almost entirely upon the diaphragm; while, on the contrary, when, in running, a freer supply of air becomes necessary, and the heart palpitates from the rapidity with which the blood is thrown into it, the thorax is urged by the stimulus of the will to a quicker respiration, and the muscles that are inserted into the clavicles and scapulæ are often called upon for their conjoint assistance. And where the mind has, from an early period of life, been in the habit of exercising such a control, it is wonderful to contemplate the quantity of air which the lungs may be brought to enclose, and the length of interval through which the life may be preserved without a fresh supply; of which savage nations furnish us with striking examples, in the act of diving and remaining under water. Diemerbroeck relates the case of a pearl-diver who, under his own eye, remained half an hour at a time under water, while pursuing his hunt for pearl-muscles.—(*Anatom.*, lib. ii., p. 464.)

The will also makes use of the muscles of respiration for a variety of other purposes; sometimes for that of freeing the aerial passages themselves, or other cavities connected with them, from some material that irritates or loads them, as in coughing or sneezing, which actions are sonorous from the violence with which the air is protruded. Hiccough, which is a quick, convulsive contraction of the diaphragm, is generally exercised, even without the consent of the will. And sometimes the will employs these powers as mere expressions of mental feeling at the moment, as in laughing, sighing, or weeping; the first of which consists of a mere succession of short and abrupt expirations; and the last two, of deep inspirations, succeeded by deep expirations; broken, in the case of weeping, into a quick series of sonorous snatches; and often accompanied, in sighing, with deep and long-drawn intonations, which we call groans.

[Sir David Barry has endeavoured to demonstrate, that in the ordinary process of respiration, the venous half of the circulating system derives considerable assistance from the action of the atmosphere on the cavity of the thorax. His experiments, as he conceives, establish the two following positions:

1st, That the cavities of the great veins within the thorax, and all the thoracic cavities, draw towards them the fluids with which they are placed in direct communication.

2dly, That this attraction or suction never takes place but during the expansion of the thorax, that is, during inspiration. And, from these facts, he deduces various inferences, among which only the two subsequent ones need here be noticed:

1st, That the blood, *which runs against its own gravity*, arrives at the heart only during inspiration.

2dly, That the power which impels it at this moment through the veins, is atmospheric pressure.*

* Phil. Trans., 1820, p. 29.—On the Elasticity of the Lungs. The above paragraph, marked for insertion in this work, was found among Dr. Good's MSS., subsequently to the publication of the last edition.—ED.

* See Barry's Exp. Researches on the Influence of Atmospheric Pressure upon the Progression of the Blood in the Veins, &c., 8vo., Lond., 1826, p. 35. The objections made to these views by Drs. Good and Wedemeyer, will be found in the third Physiological Proem of the present edition.—ED

The nerves whose influence is principally connected with the function of respiration, are the phrenic and par vagum. If the spinal cord be divided above the origin of the phrenic nerves, respiration suddenly ceases, but the action of the heart remains without any immediate change. If the same nerves be cut through in a living animal, the diaphragm becomes paralytic, and respiration is only imperfectly carried on by means of the muscles which raise and depress the ribs.

When the nervi vagi are divided in the middle of the neck, the breathing is instantly and seriously impeded, and death soon follows. This is supposed to depend upon the paralysis of the muscles, whose function is to open the glottis. In an ass, upon which this experiment had been performed, the breathing became easy as soon as an incision was made in the trachea. From Mr. Brodie's investigations (*Phil. Trans.*, vol. cii., p. 390), it appears, that when the par vagum is divided, the quantity of carbonic acid produced by respiration is lessened. It is curious to learn, from the experiments of Dr. W. Philip, that the difficulty of breathing, caused by the annihilation of the nervous influence of the par vagum, may be temporarily removed by galvanism.]

III. But the most important part of the general economy of respiration consists in the change which takes place in the blood, in consequence of its being acted upon by the inspired air.

We see the blood conveyed to the lungs of a deep purple hue, and deprived of those qualities which fit it for nutrition, secretion, the preservation of the nervous influence, and the maintenance of the vigorous action of every part and organ; or immature and unassimilated to the nature of the system it is about to support, in consequence of its being received fresh from the trunk of the lacteals. We find it return from the lungs spirited with newness of life, perfect in its elaboration, more readily disposed to coagulate, and the dead purple hue transformed into a bright scarlet. What has the blood hereby lost? How has this wonderful change been accomplished?

These are questions which have occupied the attention of physiologists in almost all ages, and were as eagerly studied in the Greek schools as in our own day. To the present hour, however, they have descended in a mantle of Cimmerian darkness; and though the researches of a more accurate chymistry have disclosed volumes of facts heretofore unknown, and the ingenuity of able theorists have laid hold of them, and applied them to an explanation of this curious subject in a great variety of hypotheses, I am afraid we are still almost as much at sea as ever; and that there is no inquiry in the whole range of physiology in a more unsatisfactory state than that concerning the ventilation of the blood in the lungs.

According to a course of well-conducted experiments, instituted many years ago by Sir Humphrey Davy, it appears that the general sum of a man's natural inspirations are about twenty-six or twenty-seven in a minute; and that thirteen cubic inches of air are, in every inhalation, taken in, and about twelve and three quarters alternately thrown out. The atmospheric or inspired air was found to contain, in the thirteen cubic inches, nine and a half inches of nitrogen, three and four tenths of oxygen, and one tenth of an inch of carbonic acid; the twelve inches and three quarters of returned air gave nine and three tenths of nitrogen, two and two tenths of oxygen, and one and two tenths of carbonic acid.

[Perhaps, in the foregoing statement, the quickness of ordinary respiration is exaggerated. Laennec says, that the breathing may be considered natural when the number of inspirations in the state of repose is from twelve to fifteen in a minute.* In the latest works on physiology, its frequency is said to vary between fourteen and twenty-seven times in a minute, but the average rate to be from seventeen to twenty. —(See *Mayo's Outlines*, vol. i., p. 87.) In the healthy state of the system, Dr. Bostock (*Physiology*, vol. ii., p. 56) observes, that we respire, upon the average, about twenty times in a minute, while the average velocity of the pulse may be reckoned at eighty; and consequently the heart contracts four times during the completion of each movement of respiration. Laennec's estimate is probably the most correct.]

From the experiments of Sir Humphrey Davy, therefore, there should seem to be a retention in the system of a large portion of the inspired oxygen, and a small portion of the inspired nitrogen; and a discharge from the system of a very considerable portion of carbonic acid gas. And as the colour of the blood is well known to be changed in its passage through the lungs, from a deep modena to a bright scarlet hue, M. Lavoisier, following up with additional facts an earlier set of experiments of Dr. Crawford, endeavoured to show, that while the modena hue is produced by the carbon with which the blood is loaded when it first reaches the lungs, its scarlet results from its losing this surplus of carbon, and acquiring oxygen in its stead; during which process a very large quantity of caloric, or heat, in an elementary form, is supposed also to be disengaged from the air thrown into the air-cells of the lungs, and to pass into the adjoining minute bloodvessels in combination with the oxygen.

[The quantity of oxygen lost by air that has been respired varies considerably, not only in the different kinds of animals, but in different animals of the same species, and even in the same animal at different times, according to the operation of certain external agents, and particular states of the constitution and functions. Under ordinary circumstances, a man consumes on the average about 45,000 cubic inches, or nearly 15,500 grs. of oxygen, in twenty-four hours.†]

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* Laennec on Diseases of the Chest, and on Mediate Auscultation, p. 13; transl by Dr. Forbes, ed. 2.

† See Bostock's Physiology, vol. ii., p. 110. Dr. Marshal Hall has inserted in the Phil. Trans. some very interesting remarks on the inverse ratio which subsists between respiration and irritability in the

The experiments of Sir Humphrey Davy were afterward repeated by Pepys and Allen; but these acute analysts could not discover that any part of the inhaled nitrogen was retained; since the same exact proportion appeared from their trials to be thrown back in every instance of expiration, as had been previously received in every instance of inspiration. And there have since been doubts on the part of Sir Humphrey Davy himself respecting the supposed caloric; not merely in regard to its separation from the atmospheric air, but as to its substantive existence at all, either there or elsewhere; heat being, in his later view of the subject, nothing more than a rapid, vibratory, or repulsive action of the corpuscles of a body that exhibits this phenomenon: thus reviving the doctrine of Aristotle and the Peripatetics, which was so ably controverted by the Epicureans, who, foretasting the spirit of the Lavoisierian system, strenuously contended that it was a substance sui generis.* While, to close the whole, Mr. Ellis has gone through another extensive range of inquiry, and instituted another numerous set of experiments, to prove that even the oxygen of the inspired air does not enter into the bloodvessels of the lungs, but becomes itself converted in the air-cells of these organs into the carbonic acid gas of the expired air, by uniting with the carbon of the blood, which he supposes, as a recrement, to be secreted in the form of a vapour into the air-cells, by the exhalants of the lungs.† He admits, however, the existence of caloric as an elementary principle; conceives it to be disengaged in very large abundance from the inspired air during its union with the secreted carbonic halitus; and ascribes the recovered scarlet hue of the blood to its combination with this invisible fluid; as he does also whatever effects are produced by the exercise of the respiratory function, not merely in animals, but in plants.

Of the facts and arguments in favour of Mr. Ellis's hypothesis, which he extends to plants as well as to animals, the two following seem to be the chief. Firstly, the seeds of plants in germination, and plants themselves in growth, throw forth carbon in the form of aqueous vapour, or, in other words, dissolved in water, even where no oxygen is present.—(Op. cit., 8vo., 1807, sect. 20.) And, secondly, such ejected fluid, wherever life exists, is the work of secretion. In consequence of which, he ventures to affirm that it is a secretion of this kind which is continually taking place on the surface of the lungs and of the skin in animals, both which, he thinks, concur in a common action; and in support of this opinion, he refers to various insects and worms, without stigmata or stemmata, which appear to breathe by the pores of the skin alone.

According to Mr. Ellis, we have no proof of carbonic acid, or of any aëriform fluid existing naturally in the blood (Op. cit., sect. 98, p. 122), and consequently have no reason to expect that any can be thrown out: while, if oxygen enter from the air-cells into the system, it must be by absorption or chymical affinity. If by absorption it would in animals take the regular course of the thoracic duct, and the blood in the right ventricle of the heart would first exhibit a scarlet hue; while, in the germination of vegetables, their seeds give no evidence of possessing a structure fitted to absorb and expel aëriform fluids; nor of any such fluids at any time existing in them.—(Op. cit., sect. 16, p. 18.) To the operation of chymical affinity, he conceives an actual contact between the air and the blood to be requisite; but in the lungs we have an intervention of the coats of the cells, and of the bloodvessels. And if these be presumed so thin, that, when moist, they will allow the air or its oxygen gas to pervade them, the gas would rather pass into the interstices of the cellular substance than into the pulmonary vessels, and thus create an emphysema. But the whole of such permeation he holds to be gratuitous, and contrary to experiment.—(Op. cit., sect. 101, p. 125.) The diminution in the bulk of respired air (calculated by Dr. Bostock to be on the average about one eightieth of its bulk), (*Physiol.*, vol. ii., p. 112), he thinks, may be accounted for by a union of the carbon of the blood with the oxygen in the air-cells, and the formation of aqueous vapour by the disengagement of the caloric from the oxygen of the atmospheric air.—(Op. cit., sect. 83, p. 99; sect 107, p. 132; and compare with sect. 11, p. 13.)

To these objections, however, it may be replied, that if caloric can penetrate animal membranes, and unite by chymical affinity with the blood in the bloodvessels, so, for any thing we know to the contrary, may oxygen. [Dr. Davy found, that in certain morbid conditions of the

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animal kingdom. He endeavours to prove that the quantity of respiration is inversely as the degree of the irritability of the muscular fibre; or, in other terms, that in cases in which the quantity of respiration is great, the degree of irritability is low. By the quantity of respiration is signified the quantity of oxygen gas consumed or exchanged for carbonic acid in a given time, by the animal placed in atmospheric air. Dr. Hall regards that muscle as the most irritable which, *cæteris paribus*, contracts most, and for the longest time, upon the application of the least degree of stimulus. According to his researches, respiration in the bird tribes and the mammalia is great, while the irritability of the muscular fibre is low. On the contrary, the reptiles, the batrachia, and the fish tribes are endued with a high degree of irritability, but possess only an inferior quantity of respiration. As Dr. Hall observes, the quantity of respiration is greater in proportion as the animal occupies a higher station in the zoological scale, being among the vertebrated animals greatest of all in birds, and lowest in fishes: the mammalia, the reptiles, and the amphibia, occupy intermediate stations. The quantity of respiration is also remarkably low in the very young of certain birds, which are hatched without feathers; and of certain animals which are born blind; and in hybernation it is almost extinct. Dr. Marshal Hall's paper is exceedingly valuable, and his contrivance for measuring the quantity of respiration with minuteness particularly ingenious: it is named the *pneumatometer*.—Ed.

* See the Author's Translation of Lucretius. Note on book ii., v. 743.

† Inquiry into the Changes induced on Atmospheric Air, 8vo., 1807.

chest, the pleuræ had the power of absorbing, and probably of exhaling air; and such absorption extended likewise to air purposely introduced between these membranes in their healthy state. Hence he inferred that mucous membranes may generally possess the power of absorbing and exhaling air; and that these operations naturally belong to the process of respiration.—(*Phil. Trans.*, 1823, p. 496.)] Mr. Porrett has shown, that the voltaic fluid, when operating upon water, is capable of carrying even water itself through the bladder, and raising it into a heap against the force of gravitation.—(*Thomson's Annals of Philosophy*, No. 43, p. 75, 76.) A like combination may take place between the voltaic or some similar fluid and the oxygen, and a part of the nitrogen gases in the air-cells of the lungs; and a similar permeation may follow directly through the membranes of the bloodvessels; and the carbon of the system may in consequence pass off by the same channel, instead of being secreted: and in the form of carbonic acid, instead of in that of carbonic vapour.

Next, we have no proof that carbon will dissolve in water, and produce such vapour; and hence, at present, this idea is gratuitous.

Again, air appears, in various cases, to have been actually disengaged, and is, perhaps, perpetually disengaging from the blood. Mr. J. Hunter declares he has discovered it in an abscess, in which it could neither have been derived from without nor from putrefaction (*Animal Economy*, p. 207); and he hence adopted the opinion that air is often secreted by animal organs, or separated from the juices conveyed to them.* And this opinion has not only been abundantly confirmed, but even extended to the vegetable world since his time; for Mr. Bauer appears to have shown, that an elastic gas is constantly shooting forth in small bubbles from the roots of plants into the slimy papulæ by which they are surrounded; and that it is hence the slimy matter becomes elongated, and is rendered vascular, or converted into hair or down. And Mr. Brande instituted experiments tending to prove that carbonic acid does exist, and that, too, in a considerable quantity, in the blood of animals, while circulating through both arteries and veins; and that it is so largely poured forth from blood placed, while warm, under the receiver of an air-pump, as to give the appearance of effervescence; a fact familiar to Mr. Boyle nearly two centuries ago. The venous and arterial blood, according to Mr. Brande's experiments, seems to contain an equal proportion of this gas; and he calculated that not less than two cubic inches were extricated from every ounce of blood thus experimented upon. And hence Sir Everard Home, following up the discoveries of Mr. Bauer, ingeniously conjectures that it is by the escape of bubbles of this gas from the serum of blood, in cases of effusion and coagulation, that new vessels are formed; as also granulations in pus, as a like gas appears to be separable from this latter fluid.—(*Phil. Trans.* for 1818, p. 180.)

[Dr. John Davy arrived, however, at a conclusion entirely different from that of Mr. Brande, namely, that no free carbonic acid exists in the blood. In the spontaneous coagulation of this fluid, and in that of the serum by heat, he never observed carbonic acid to be disengaged; nor has he been able to procure carbonic acid gas from blood just taken from the vessels, still warm, and placed under a receiver, and completely exhausted of air. He states that he has raised the temperature of the blood and serum to blood-heat, and coagulated both by a heat of 200° Fahrenheit, without a particle of gas being extricated.—(See *Edin. Med. and Surg. Journ.*, No. 95.) This discrepance between philosophers of such eminence seems to demand a careful repetition of their experiments by others.]

After what has been stated, the observations of Mr. Ellis are by no means sufficient to subvert the Lavoisierian hypothesis of respiration. And some late experiments, both of Gay Lussac and of Magendie, tend to support those of Sir Humphrey Davy, since they concur in proving that, in the act of respiration, there is a little more carbonic acid gas than oxygen consumed.

Since the first edition of this work was printed, the objections here offered to Mr. Ellis's conclusion, and the support thus attempted to be given to M. Lavoisier's hypothesis, have been amply and very plausibly supported by a new set of experiments, conducted with the utmost accuracy, and upon a far more extensive scale than ever, by Dr. Edwards of Paris, who is fairly entitled to be regarded as one of the clearest and ablest physiologists of the present day. [The doctrine, that the essential part of respiration is the union of the carbon of the blood with the oxygen of the atmospheric air, and the consequent formation of carbonic acid, implies that the carbonic acid produced in breathing is precisely equal to the volume of oxygen lost. Although this was maintained to be the fact by Allen, Pepys, Ellis, Magendie, and others, the experiments of Dr. Edwards may be considered as a decided refutation of the theory. According to this eminent physiologist, the excess of oxygen consumed in respiration, above the volume of carbonic acid gas produced, varies from nearly one third of the oxygen that disappears to almost nothing. The variation depends upon the species of the animal employed; upon its age, peculiarity of constitution, and condition at different periods.* Hence a different theory of respiration. Part of the oxygen that disappears may be absorbed in the lungs, and the remainder may either combine with the carbon of the blood, and form carbonic acid, or the whole of the oxygen may be absorbed, and the expired carbonic acid be a new secretion. The latter hypothesis is espoused by Dr. Edwards. When,

* See various facts in confirmation of this view in Dr. Davy's "Observations and Experiments on Air found in the Pleura," &c.—Phil. Trans., 1823, p. 496.

* De l'Influence des Agens Physiques sur la Vie, &c., p. 418. Paris, 1824, 8vo.

in the month of March, frogs are immersed in pure hydrogen for eight hours, after all the air in their lungs has been pressed out, they continue to breathe, though less and less vigorously, and emit carbonic acid. The same fact was observed in kittens subjected to a similar experiment. A doubt has been suggested whether the carbonic acid came from the lungs, because it is exhaled when frogs are placed in hydrogen in the summer months, and breathe rarely, or not at all. It is also argued that, even supposing the carbonic acid were derived from the lungs in these experiments, it may not be exhaled by the lungs in the natural state of respiration. On the whole, however, Dr. Edwards's views must be allowed to rest on facts, not readily admitting of any other interpretation than what he has given them.] The experiments of the same distinguished physiologist also prove, that nitrogen gas is exhaled, and likewise absorbed. The carbonic acid is sometimes equivalent to the oxygen which disappears, but sometimes also it is less; and the nitrogen gas exhaled is sometimes inferior, sometimes equal, and sometimes superior, to the quantity absorbed.

The quantity of air inhaled in a single act of inspiration, is found to vary in persons of different-sized chests; but the aggregate inhaled in a given period, does not essentially differ; since those who inhale most at a time make the fewest inspirations in a minute. I have said that Sir Humphrey Davy calculated the average number of respirations in a minute at twenty-six or twenty-seven, and that the measure of air inspired or expired was estimated at about thirteen cubic inches each time. This breathing has since been supposed too rapid for a common standard, and the measure of air received and returned too low; but, as the former error compensates the latter, the amount of air does not essentially deviate from the general allowance for a minute. And it is by this explanation alone that we can in any way reconcile the different results which have been given by different experimenters upon this subject. Dr. Godwin calculated the inspired air at twelve cubic inches, and the expired at fourteen, being a difference produced by expansion from the heat of the lungs (*Connexion of Life with Respiration*, pp. 27, 37); which does not essentially vary from the above estimate of Sir Humphrey Davy; and he calculated the residuary air in the lungs, immediately after expiration, at one hundred and nine cubic inches, which, upon inspiration, was increased to one hundred and twenty-three. But Borelli states the inspired air at from fifteen to twenty cubic inches (*De Motù Animal.*, p. 126); while Jurin, Haller, and Menzies give that which is expired at not less than forty.—(*De Respirat.*, p. 32.)

In good health, perfect quiet, with an open chest, few persons, perhaps, are found to breathe more frequently than about twenty times in a minute; and the quantity inhaled and exhaled, at a temperature of fifty-five of Fahrenheit, is estimated at from twenty-six to thirty-two cubic inches each time; which, however, by the heat of the lungs, and saturated with moisture, become forty or forty-one cubic inches in the chest itself. Taking, then, twenty cubic inches as the ordinary quantity of external air inhaled and exhaled about twenty times in a minute, it will follow that a full-grown person respires twenty-four thousand cubic inches in an hour; or five hundred and seventy-six thousand cubic inches in the course of a day; a total equal to about thirty-nine hogsheads.

The quantity of carbon thrown out of the system of the lungs, when estimated in the gross, may afford matter of no less astonishment. For, taking the gravity of the carbonic acid gas as calculated by Lavoisier, a person in health must emit from his lungs something more than is equal to twelve ounces of solid carbon, or charcoal, every twenty-four hours; or, according to another estimate, five thousand two hundred and eight grains.—(*Bostock's Physiol.*, vol. ii., p. 111.)

The primary cause of the red colour of the blood is a chymical, rather than a physiological question: and belongs to the sanguiferous, rather than to the respiratory function; yet, upon this point also, physiologists are by no means agreed, some ascribing it to the conversion of the iron, which forms a constituent principle of the blood, into a red oxyde; and others, and particularly Sir Humphrey Davy, to the affinity which the calorific rays of light have for oxygen generally, and hence, for the oxygen of the animal system; against the surface of which it is perpetually impinging, and into which it is perpetually carried in combination with the inspired air; separating it incessantly from its union with the carbon of the animal frame, and transforming the carbon, thus decomposed and simplified, into a dark pigment. But there are difficulties that hang about both these, and, indeed, every other hypothesis that has yet been started, concerning even the primary cause of the red colour of the blood, as we shall have occasion to notice more at large hereafter.

Yet, whatever may be the primary cause of the red colour of the blood, we find that, in respiration, there is some other cause superadded, and which, as observed above, heightens the colour the blood possesses at the time of its reaching the lungs, and converts it from a deep purple, or modena, into a rich scarlet. This M. Lavoisier, as we have already hinted, supposed to be produced by that supply of oxygen which he conceived it was the express object of respiration to communicate to the blood; and in support of this view, a variety of experiments were appealed to, which seemed to show that the colour of the blood becomes brighter whenever exposed to the action of oxygen. Yet, till all the objections of Mr. Ellis are satisfactorily removed, and those of Dr. Edwards are further confirmed, that oxygen in a free state is actually introduced from the aircells of the lungs into the adjoining minute bloodvessels, we can place little dependance upon this explanation, however plausible and inviting.

But, may not the deepened colour of the

blood be produced by the carbon, with which it becomes gradually loaded in the course of its circulation, and which, by the consent of all parties, is separated from it in the process of respiration! and, consequently, may it not recover its brightness by the mere loss of this dingy pigment, whether oxygen enter at the same time into the bloodvessels or not? If the primary colouring material of the blood be the iron which it contains, as first suggested by MM. Parmentier and Deyeux, and the carbon be a recrementory and adventitious material, this reply might be satisfactory; but if, as supposed by Sir Humphrey Davy, the carbon of the blood be itself the pigment that colours it from the first, the explanation will content but very few. Yet this last hypothesis is as open to attack as any of the rest; for, to say nothing of the difficulty of conceiving how the carbon of the animal fluids can give a deep die to the blood, while it gives no die whatever to any of the fluids besides, it is sufficient to observe, that an abstraction of a part of this die may, indeed, form a lighter hue of the same kind, but not a different hue. The hypothesis has yet to account for that yellow or orange teint, which must be added to the red venous blood before it can become changed into the red of the arterial; for, as a simple dilution of venous blood will not furnish this teint, so neither will a simple abstraction of the only colouring material which is hereby supposed.*

[In the consideration of the cause of the loss of the bright scarlet colour, one fact, pointed out by Mr. Hunter, merits particular notice, viz., that blood, when it is rendered stagnant in an artery by the effect of a ligature or the tourniquet, or in the cellular membrane by extravasation, assumes the purple colour of venous blood.—(*On the Blood*, p. 65.) But, as Dr. Bostock properly remarks, even if Hunter's experiments, and certain others undertaken by Hassenfratz, were to be received as proofs that the change of blood from the arterial to the venous state may be effected independently of any addition from without, it does not necessarily follow that the reverse operation can happen in the same manner; nor, indeed, have we any evidence that it ever has been accomplished, without the intervention of oxygen.—(*Physiol.*, vol. ii., p. 133.)]

It may perhaps be said, that though oxygen do not get admission, caloric does; and this, too, very freely, and becomes itself the cause of this change of colour. And, in truth, this is the explanation offered by Mr. Ellis and various other physiologists; who contend that the function of respiration consists, firstly, in freeing the blood from its load of carbon, and, secondly, in introducing a very large portion of the matter of heat in its stead; thus far advocating the hypothesis of Dr. Crawford. And as a proof that caloric, as a substance, is separated from the inspired air, they appeal to the quantity of vapour that is formed in the vesicles of the lungs simultaneously with a formation of the carbonic acid, and which they ascribe to this cause: regarding the lungs as the great laboratory, in which the matter of heat or caloric is accumulated, and rendered fit for the use of the system.

But this again is to take for granted what yet remains an unsettled question, namely, whether caloric be a substance or a mere quality of body Independently of which, admitting the substantive existence of caloric, and that some organ or other is specially employed in its evolution and introduction in a free state into the system, it is by no means established that this organ is the lungs; for Dr. Currie, in an ingenious paper published some years ago, attempted to show, by various experiments, that this is chiefly effected by the action of the stomach, which was also the doctrine of Mr. Hunter. And Mr. Brodie has long since brought other experiments that seem to refer it to the action of the brain. —(*Phil. Trans.*, 1812, p. 378.) Perhaps, however, all these, and various other organs, may co-operate to the same effect.

Much still remains to be ascertained upon this interesting subject. Even the recovery of the bright hue itself to the blood, by whatever means accomplished, and which by most physiologists is regarded as a fact of the utmost importance in the process of respiration, is contemplated by Mr. John Hunter as of scarcely any importance whatever, except as a proof that the blood has undergone the action of ventilation; an action which he conceives, from its being as necessary to white-blooded animals as to red-blooded, produces a far greater effect on the coagulating lymph than on the red particles.—(*On Blood*, pp. 204–206, &c.) And hence, though we have an abundance of facts and experiments upon the subject before us, and an abundance of speculation in respect to them, "the COMMERCIUM MENTIS ET RERUM," as Lord Bacon has elegantly expressed it, has not hitherto led to any established doctrine, however creditable it has been to the industry and ingenuity of those who have engaged in it.

* Some Observations on this subject, by Dr. Stevens and Mr. Hoffmann, will be referred to in the next Physiological Proem.—ED.

CLASS II.

PNEUMATICA.

ORDER I.

PHONICA.

AFFECTING THE VOCAL AVENUES.

The term Phonica (ΦΩ'ΝΙΚΑ) is sufficiently explained in the definition. The order of diseases which it is intended to comprehend, are seldom dangerous or acutely painful; and are rather characterized by trenching upon the grace or utility of the voice, than undermining the general health. It embraces the following

GENERA.

I. Coryza	Running at the Nose.
II. Polypus.	Polypus.
III. Rhonchus.	Rattling at the Throat.
IV. Aphonia.	Speechlessness.
V. Dysphonia.	Dissonant Voice.
VI. Psellismus.	Dissonant Speech.

GENUS I.

CORYZA

RUNNING AT THE NOSE.

DEFLUXION FROM THE NOSTRILS OBSTRUCTING THEIR CHANNEL.

In the commentary to the nosological text, I have ventured to point out what seems to be the real origin of the term coryza, concerning which the Greek lexicographers are at a loss; and have shown it to be a genuine and very extensive as well as very ancient oriental term, common, under some modification or other, to the Hebrew, Arabic, Chaldee, and Syriac dialects, from one of which it was doubtless imported into the Greek tongue. By Hippocrates it was used in a very extensive sense, so as to signify defluxion of any kind, whether from the head, nostrils, fauces, or chest. The later Greek physicians restrained coryza to a defluxion from the head and nostrils, and applied the term catastagmus to a defluxion from the fauces and thorax. Among modern writers, at least since the time of Cullen, coryza is used synonymously with catarrh, and is consequently regarded as a febrile affection. But this is rather to confound morbid affections than to simplify them. Coryza, running, defluxion or distillation from the nose, may indeed occur as a symptom in catarrh, as it may also in various other complaints, as the measles, and some species of ophthalmia; but it may also occur, and as a simple and idiopathic affection does occur, without febrile action of any kind. In which cases, indeed, it is of little importance, and not often worthy of medical interposition: yet, in a general system of morbid affections, it ought no more to be passed by unnoticed, than a hedge or bog plant in a system of botany.

Simple defluxion from the nostrils may proceed from two very different states of body, or of local power in the organs affected; which furnish us with two distinct species of affection, characterized by sufficiently marked and discrepant symptoms:—

1. Coryza Entonica.	Entonic Coryza.
2. Coryza Atonica.	Atonic Coryza.

SPECIES I.

CORYZA ENTONICA.

ENTONIC CORYZA.

THE DEFLUXION PELLUCID, MUCOUS, OR ROPY; WITH A SENSE OF IRRITATION OR INFARCTION.

In this species there will always be found an increased action of the secernent emunctories of the nostrils, while the absorbents remain little disturbed in their function; and as a morbid diminution of active power is ordinarily expressed by the terms atony, and atonic, so entony and entonic are in the present work employed to express the opposite, or a morbid excess of activity. According to the difference of the stimuli or accidental causes, by which the present affection is produced, there will be some difference in the symptoms: for these causes may be, sternutatories; the irritation of continuous sympathy, as in crying or weeping; a damp chill, or some other change produced suddenly in the temperature, or perhaps temperament, of the atmosphere. And it is still more generally, and often with great abruptness, brought on by a transfer of action, or a sort of reverse sympathy with some remote organ. Thus, there are many persons, who, as Dr. Darwin observes (*Zoonom.*, Cl. I., Ord. I., ii. 7), by sleeping at night with their arms or shoulders accidentally uncovered, become cold and torpid in the cutaneous vessels of these organs, and have their nostrils instantly affected with increased action, filled with mucus, and so thickened in the mucous membrane, as to render them almost incapable of breathing.

An ozæna or nasal ulcer will also frequently produce a like effect; in which case the increased defluxion will be intermixed with a purulent or ichorous matter, sometimes throwing forth an offensive smell: all which may be arranged in a tabular form under the following varieties:—

α Sternutatoria.	From sternutatories: accompanied with sneezing.
β Lachrymosa. Snivelling.	From weeping or crying: the lachrymal secretion being increased by mental emotion.
γ Catarrhalis. Snuffling.	From sudden chill or moisture in the temperature or temperament of the atmosphere.
δ Ozœnosa.	The defluxion more or less purulent; or ichorous and fetid.

The last is a case of surgical rather than of medical treatment, and is often connected with a caries of the ossa spongiosa, or ossa nasi, and frequently with a lodgment of pus in the frontal sinus or antrum maxillare; in both which cases the inflammation is at times accompanied with excruciating pain. The first is peculiarly common to grazing animals, and especially to sheep, from the irritation of minute insects, and especially those of the gadfly, whose eggs have been deposited in the upper part of the nostrils by the impregnated female.

From the dryness of the mucous membrane of the nostrils in India, the common coryza is peculiarly frequent under the name of *naukera*. The natives cure it in its onset by topical bleeding; for which purpose they prick the inflamed membrane with a sharp-edged grass, which answers the purpose of a lancet, and soon relieves the pain by the flow of blood which ensues.*

A warm atmosphere easily, and in a short time, takes off the variety produced by a sudden application of cold, or a sudden change in the temperament of the atmosphere, and which makes an approach towards a catarrh, though without any sense of heaviness or oppression in the head, or harshness in the fauces. From the obstruction of the nostrils, however, there is usually a nasal voice and a deficiency or loss of smell; and, where the discharge is acrid, an excoriation of the mucous or Schneiderian membrane. When it is the result of a reverse sympathy with the arms or other limbs, rendered chilly at night by being uncovered, it is easily and almost instantly removed by covering the chilly organs with additional bedclothes, and thus restoring the balance of heat and cutaneous secretion.

In a singular idiosyncrasy, reported in the Ephemera of Natural Curiosities, the odour of roses, without amounting to a sternutatory, proved a stimulus sufficient to excite a coryza whenever applied.—(Dec. ii., ann. v., obs. 22.) It is well remarked by Galen, that various foods produce a like effect (*Fragment ex. Aphor. Rabi Moyses*, p. 36); and Bonet, in one instance, found it occasioned by a globular tumour, surrounded by a fluid in the ventricles of the brain (*Sepulchr.*, lib. i., sect. xvii., obs. 10), probably from an excitement of the olfactory nerves, which take their rise in the corpora striata, situated in this quarter of the cerebrum.

SPECIES II.

CORYZA ATONICA.

ATONIC CORYZA.

THE DEFLUXION LIMPID, AND WITHOUT ACRIMONY OR SENSE OF IRRITATION.

The chief causes are, exposure to a keen frosty air; the natural paresis of old age; and a long and immoderate use of strong aromatics, volatile alkali, or snuff; affording the three following varieties:—

α Algida.	From exposure to a keen frosty air.
β Senilis.	From old age.
γ Superacta.	From habitual indulgence in snuff, or nasal stimulants.

In all these there is diminished action in both the secernent and absorbent vessels of the nostrils, but chiefly in the latter, which almost uniformly yield soonest, from causes we shall hereafter have to explain. And hence, while the secernents are only capable of separating a thin limpid water, instead of a viscid mucus, the absorbents are too inert to carry off even this, which in consequence accumulates, and drips from the nostrils. A warm atmosphere, or the vapour of warm water snuffed up the nostrils, affords an easy remedy for the first variety of this species, which far more frequently occurs, and perhaps only occurs, in a dry, sharp, frosty air, than in an atmosphere rendered chilly from damp; damp being, as already noticed, rather a cause of the preceding species. In the former case, the severity of the cold overcomes all power of reaction; and hence, notwithstanding there is a defluxion, because whatever is secreted is not carried off by the correspondent absorbents, the discharge is checked in its quantity, at the same time that it is rendered more limpid. In the latter case the tone of the excretories rises superior to the chill to which they are exposed, and the reaction ascends to something of a morbid excess. A warm room, and particularly the excitement of a gentle perspiration, will cure both; but the first is also often cured by brisk walking, or any other vigorous exercise proportioned to the sharpness of the frost; for as the system becomes roused generally, the nasal excretories become roused also, and triumph over the cold with a reactive power, which is at the same time communicated to the correspondent absorbents, when the defluxion immediately ceases.

The last two varieties are beyond the reach of medical aid. The coryza, or snuffling of old age, is precisely analogous to its ptyalism or drivelling. In the one the atony is seated in the excretories of the salivary glands; in the other, in those of the mucous membrane of the nostrils. Among the habitual irritants that lead to the same effect, snuffs are the worst; for the tobacco of which they consist operates with the mischief of a narcotic as well as of a stimulant; and hence the copious and foul secretion with which the nostrils of aged snuff-takers are constantly deformed.

GENUS II.

POLYPUS.

POLYPUS.

FLESHY, ELONGATED EXCRESCENCE, GENERALLY SHOOTING FROM A COMPARATIVELY SLENDER ROOT ATTACHED TO SOME PART OF THE MUCOUS MEMBRANE OF THE NOSTRILS; EXTENDING IN DIFFERENT DIRECTIONS, AND AFFECTING THE SPEECH.

This is the polypus, properly so called, and

* Miscellaneous Obs. on certain Indigenous Customs, &c., in India, by Daniel Johnson.

the disease to which the term is applied by Celsus, and continued to be applied till after the days of Heister, who uses it in the same restricted sense. More lately, however, the term polypus has been employed in a much looser signification, and made to import concretions and excrescences appearing in various channels or cavities of the body, of very different origins and textures, as those of the heart; those of the uterus and bladder, which are caruncles or sarcophytes, with a slender base or peduncle; and those of the trachea in croup, which are concrete gluten; whence the croup is by such writers denominated *angina polypus* or *polyposa*.

It is better, with the old authors, to restrain polypus, as a distinct generic term, to peduncular excrescences in the nostrils, and to distinguish by the phrase polypous tumours, caruncles, or shoots, such adscititious productions as may have a resemblance to them in other organs.*

Polypus, in the above limited sense, comprises two species, from the very different texture under which it is found.

1. Polypus Elasticus. Compressible Polypus.
2. ——— Coriaceus. Cartilaginous Polypus.

SPECIES I.

POLYPUS ELASTICUS.

COMPRESSIBLE POLYPUS.

SOFT, COMPRESSIBLE, UNACHING, CHIEFLY PALE-RED; APPARENTLY ORIGINATING FROM DISTENTION OR RELAXATION OF THE SCHNEIDERIAN MEMBRANE.

THIS species is very apt to be affected by the state of the atmosphere; being often retracted and shrivelled in dry weather, and enormously enlarged and elongated in thick, hazy weather. There is little pain during any stage of its progress, however troublesome it may be to deglutition or the voice. [The most common variety of the compressible polypus is that which bears, in consistence, shape, colour, and size, a striking similitude to the common oyster.—(See *Gibson's Surgery*, vol. ii., p. 296. Philadelphia, 1825.)] If attended to when small, or in an incipient state, it may often be prevented from growing large by the use of astringent applications; as a strong solution of alum, a decoction of oak-bark, or the application of vinegar or brandy. But where the excrescence becomes inconvenient from its bulk, it ought to be instantly extirpated. When timely attendance is not paid to it, and especially in unhealthy habits, it sometimes assumes a scirrhous character, and at length is apt to bleed with great freedom, sloughs, and ultimately produces, from its increased size and malignity, a horrible disfigurement of the face, and renders life most pitiably distressing. And where it does not become strictly cancerous, it degenerates into a fungous ulceration, nearly as much to be dreaded.*

[Experience proves that extraction with a suitable kind of forceps, is generally the best method of extirpating nasal polypi. In a very few instances other plans are allowable. Thus, in one case, under the care of Mr. Robertson, of Kelso, the size of the polypus rendered the introduction of a pair of forceps, or a ligature, impracticable. Hence, an incision was made through the nose on the affected side, and the mass of the polypus brought into view. Two ligatures were passed through it; but its magnitude was such that its root could not be reached. By perseverance, however, so much of the tumour was cut away, with the aid of the ligature, that Mr. Robertson at length succeeded in detaching the root with the point of his finger.†]

SPECIES II.

POLYPUS CORIACEUS.

CARTILAGINOUS POLYPUS.

FIRM, CARTILAGINOUS, OFTEN PAINFUL, CHIEFLY DEEP-RED: APPARENTLY ORIGINATING FROM, OR CONNECTED WITH, CARIES OF THE ETHMOID BONE.

THIS species is not only painful, but, from being firm and deep-seated, very troublesome in removal. It is not always, indeed, that it can be extirpated entire, or that it is advisable to extirpate it when possible. When extracted imperfectly, it is very apt to regenerate, and has sometimes become cancerous.

It is too generally believed, however, that polypi in all instances may and ought to be extracted; and that, if the shoot can be laid hold of by the forceps, and we are not afraid of any hemorrhage, nothing is to be dreaded from the operation. Mr. Pott was of a different opinion: he had observed many cases, which, though neither scirrhous nor cancerous, were very unfit for any chirurgical process. Some circumstances, he remarks, may forbid the attempt, from the impossibility of its being successful; others, from its being more likely to increase and exasperate the disease than to cure it. He dissuades from the operation in almost every instance of the second or coriaceous species; in all those cases in which the polypus begins with considerable pain in the forehead and upper part of the nose, or is preceded by these symptoms; and which, as soon as it can be seen, is either highly red, or of a dark colour; which is never alternately smaller and larger, but rather progres-

* Polypi are now regarded as growths peculiar to mucous membranes, or surfaces; and as these exist in various parts of the body, so must polypi also present themselves in different situations.—ED.

* Lectures of Sir Astley Cooper, Bart., with additional notes, &c., by F. Tyrrell, Esq., vol. i., p. 354, 355, 8vo., 1825. Whether the soft compressible polypus, originally of a benign character, ever becomes one partaking of a cancerous nature, or rather of the character of fungus hæmatodes, may be doubted.—ED.

† Edin. Med. Journ., No. 90, p. 44. Graefe has invented some most ingenious contrivances for trying polypi in the nostrils, as well as other situations. These instruments are constructed and sold by Mr. Weiss, of the Strand.—ED.

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sively increasing; in which the common actions of coughing, sneezing, or blowing the nose, give pain, or produce a very disagreeable sensation in the nostril and forehead; in all cases of polypi, which, when within reach, are painful to the touch, or which, upon being touched slightly, are apt to bleed; those which do not seem to be moveable by the action of blowing the nose, or driving the air through the affected nostril only, when confined to one side; those which are incompressibly hard, and, when pressed, occasion pain in the corner of the eye, or in the forehead, and which, if they discharge any thing, shed blood; those which, by adhesion, occupy a very considerable space, and seem to consist of a thickening or an enlargement of the membrane covering the septum narium; those from which there is a discharge of an ulcerous, offensive, discoloured fluid; and those round the lower part of which, within the nose, a probe cannot easily and freely be passed to some height. In all cases thus characterized, Mr. Pott was of opinion, that no trial should be made by the forceps; and he advised further, that no attempt to remove them should be made by any other means, with which he had the good fortune to be acquainted.*

But where these characters do not occur, and, in general, where the polypus answers to the first species in elasticity and colour, he recommends its removal, and by the forceps rather than by escharotics, ligature, or any other means; and thinks it may be extracted with great safety.†

GENUS III.
RHONCHUS
RATTLING IN THE THROAT.

HARSH, SONOROUS BREATHING FROM STAGNATION OF MUCUS IN THE VOCAL CANAL.

There are two species of morbid affection which may be arranged under this genus, each of which has been raised to the rank of a distinct genus by Vogel and several other nosologists; while by Cullen, and those who have followed him, they have been entirely struck out of the catalogue of morbid affections, as either unworthy of notice, or merely symptomatic of some other complaint.

To a generic distinction they are scarcely entitled; but a slight acquaintance with the habits and morbid actions of the system is sufficient to afford instances in which both sorts are idiopathic. Many persons have a thick or wheezy respiration, produced by corpulency, or by changes of the atmosphere, from hot to cold, or from dry to moist, without any other disease. Many persons snore habitually during sleep; and most persons have a tendency to do so as they grow old. Under such circumstances, the affections before us are strictly idiopathic. They are not often indeed accompanied with much inconvenience; but, as deviations from a perfect state of health, they have a full claim to their respective places in a general system of nosology. Confervæ in botany, and infusory worms in natural history, are as confessedly objects of scientific arrangement and study, as the oak and the elephant.

The two species, then, appertaining to the present genus, are the following:—

1. Rhonchus Stertor. Snoring
2. ——— Cerchnus. Wheezing.

M. Laennec has increased the subdivisions of rhonchus, or, as he calls it, *râle*, to five; and as modified by a variety of primary diseases of the chest, they may easily be extended to this number; but then they become more symptoms, and not idiopathic affections. "For want," says he, "of a better, or more generic term, I use the word *râle*, *rattle*, or *rhonchus*, to express all the sounds, besides those of health, which the act of respiration occasions, by the passage of the air through fluids in the bronchiæ, or lungs, or by its transmission through any of the air-passages partially contracted." He distinguishes five principal kinds of rattle:—1. The moist crepitous. 2. The mucous, or guggling. 3. The dry sonorous. 4. The dry sibilous, or hissing. 5. The dry crepitous, with large bubbles, or crackling.*

SPECIES I.
RHONCHUS STERTOR.
SNORING.

THE SOUND DEEP AND LOUD; PRODUCED IN THE LARYNX AND FAUCES.

As a symptom, this is common to apoplexy; but, as I have just observed, it is found idiopathically in many instances, brought on by advancing age, or peculiar to the habit. A syrup, made of the leaves of the erysimun *officinale*, or hedge-mustard, was for this kind of noisy breathing once popular; and the pungency of the plant may often prove useful. The common cause is here, a lodgment of the tougher and denser part of the mucous secretion of the larynx and fauces in these passages.

In some cases, as in the atonic coryza of age, the excretories of these organs may be permanently relaxed, so as to admit of a larger defluxion than in health and vigour. And hence, local stimulants are particularly applicable; among the best of which may be ranked cam-

* This form of polypus is termed by Prof. Mott, the chondromatous; it is often attached to the inferior turbinated bones. Dr. Mott recommends for its cure, the removal of the turbinated bone with which it is connected, which may be done without inconvenience.—D.

† Chirurgical Obs. relative to the Cataract, Polypus of the Nose, &c., 8vo., Lond., 1774. The most common malignant polypus of the nose, is now generally believed to be of the nature of fungus hæmatodes, or medullary sarcoma, to which the surgeon cannot usefully apply any operation in this situation. Palliative treatment is all that can be adopted.—Ed.

* De l'Auscultation Médiate, ou Traité du Diagnostique des Maladies des Poumons et du Cœur, &c., par R. T. H. Laennec, &c., 2 tomes, Paris, 1819; and translation, with Notes, by Dr. Forbes, 2d edit., p. 49.

phire, and other terebinthinate medicines, gum ammonia, and the alliacea.

SPECIES II.
RHONCHUS CERCHNUS.
WHEEZING.

THE SOUND DENSE AND IMPEDED; PRODUCED BELOW THE LARYNX.

THIS affection, as a symptom, is common to asthma and dyspnœa; but, as I have already observed, it is sometimes found as a primary evil, or independent of any other complaint. In the introductory dissertation to the present class we remarked, that a considerable quantity of aqueous vapour is formed in the air-cells of the lungs during the process of respiration; supposed, by the physiologists who contend for the inhalation of caloric as a distinct substance, to be produced by its separation from the inspired air of the atmosphere, and the union of a part of its oxygen with the hydrogen furnished by the lungs. In health, this vapour is very freely exhaled by the mouth, and forms that mist which is seen to issue from every man's lips in frosty weather, and especially when thrown upon a dark polished surface, as that of a mirror. But, if the bronchial vessels be obstructed by a more than ordinary increase or accumulation of mucus, it escapes with difficulty; and, encountering the air that is thrown into the lungs, occasions that hissing or wheezing sound, which is always produced by a current of air when it has to force its passage through a body of dense vapour. Commonly, therefore, this is a case of atony, local or general; and, like the last species, will be best relieved by those medicines that gently stimulate, and warm, and give power to the bronchial lymphatics, as the resinous gums, and the bulbs of the alliaceous plants. In fat people, and especially those who are low of stature, short-necked, and oppressed with fat about the chest, the obstruction is chiefly the result of infarction and pressure; for the diaphragm and other muscles not having full play, the lungs are never thoroughly expanded, and the extricated vapour is put into a smaller space, and has a narrow exit. And here the only cure must consist in taking off the obesity by repeated venesections, active purgatives, vigorous exercise, and a low diet.

GENUS IV.
APHONIA
DUMBNESS. SPEECHLESSNESS.

INABILITY OF SPEECH.

WE now proceed to a group of diseases that affect not so much the trachea or general avenue of sound, as the organs of articulation fixed on its upper end, like a capital upon a pillar, as M. Blumenbach has elegantly observed, and consequently which impede or vitiate the power of speech. These have been very differently arranged by different writers, and have often been very unnecessarily extended and complicated, especially by Vogel, as may be seen by a reference to the commentary in the author's volume on Nosology. Upon the whole, they will be found to distribute themselves most easily and distinctly under the three following generic divisions:—Defects that depend on an utter inability of speech; those in which the sound of the voice is imperfect or depraved, and those in which, while the sound of the voice continues unaffected, the articulation is incorrect or vitiated. It is the first of these divisions that constitutes the genus before us.

Inability of speech may proceed from three different causes, each of which lays a foundation for several symptoms peculiar to itself, and consequently for the three following species:—

1. Aphonia Elinguium. Elingual Dumbness.
2. ——— Atonica. Atonic Dumbness.
3. ——— Surdorum. Deaf-dumbness.

SPECIES I.
APHONIA ELINGUIUM.
ELINGUAL DUMBNESS

SPEECHLESSNESS FROM DESTITUTION OF TONGUE.

THIS may be of two sorts; each of which lays a foundation for very different results:—

α Congenita.	The defect coeval with the birth.
β Oblæsa.	The defect produced by accident, punishment, or disease.

The glottis is the chief organ employed in dividing the voice into distinct or simple tones or notes; as the tongue chiefly divides it, either singly, or by a co-operation with other organs, into distinct articulations, so as to form proper language, which is hence commonly regarded as nothing more than a modification of the powers of the *lingua*, as the *tongue* is called in Latin; and hence *tongue* and *language* are often used synonymously. It is obvious, therefore, that, in all common cases, the man who is deprived of his tongue, whether by congenital defect, by mechanical force, or by disease, must at the same time be deprived of the power of speech and become dumb.

I say in all common cases; for a privation of the tongue is not always accompanied with dumbness. It is not necessarily so in all cases of congenital destitution, and still less in all cases of privation that occur after speech has been acquired. In the Physiological Proem to the present Class we had occasion to remark, that the glottis alone, in some instances, either from a greater pliancy and volubility of the muscles proper to it, or from the possession of some superadded muscle or membrane, seems to have a power of forming distinct articulations without the assistance of the tongue: and I hence endeavoured to account for that singular talent, which we denominate ventriloquism. But there is a more singular talent still, that sometimes occurs in the history of the human voice, and which is probably resolvable into the same cause; for we have examples, supported by indisputable authentication, of persons who, hav-

ing lost the entire organ of the tongue, and a few of them of the uvula also, have still retained a power of speaking, and even of expressing themselves with a clear and accurate enunciation. Such examples, indeed, are not very common; but they seem to have occurred in all ages, and especially when it was the barbarous custom among the Turks, Goths, and other half-civilized nations, to cut out the tongues of the unhappy wretches, whom the chance of war had thrown into their hands as prisoners.

Some persons profess to disbelieve all the stories of this kind, for the mere reason that they have never witnessed any thing of the same kind in their own age or country. But such persons would have also joined the King of Siam in disbelieving the Dutch ambassador's assertion, that the rivers in his own country became so hard and solid during the winter, that men and women could walk and skate upon them. The accounts are too numerous, and in many instances too well supported, to be treated with skepticism; and all that is left to our judgment and ingenuity is not to deny the evidence, but to account, as we shall presently proceed to do, for the fact.

Hundreds of cases might be quoted upon this subject; but the following may be sufficient, though others are referred to in the nosological system, which may be examined at the reader's leisure. Those now selected are taken from recent times, and from authorities that may indeed be disbelieved, but cannot be disputed.

In the third volume of the Ephemerides Germanicæ, we have the history of a boy who, at eight years of age, lost the whole organ of the tongue, in consequence of a sphacelus proceeding from the smallpox, and who was able to talk after its separation. The boy was exhibited publicly, but a trick was generally suspected; in consequence of which the boy and his friends were summoned to appear in court before the members of the celebrated university of Saumur. In the presence of this learned body, he underwent a strict examination as to the loss he had sustained, and the lingual powers he still possessed. The report was found correct; and the university, in consequence, gave their official attestation to the fact, in order, as it expressly asserts in its records, that its reality might not be called in question in succeeding times.

In the Mémoires de l'Académie des Sciences for the year 1718 is an account of a girl who was born without a tongue, but had nevertheless learned to speak, and talked as easily and distinctly as if she had enjoyed the full benefit of that organ. The case is given by a physician of character, who had accurately and repeatedly examined the girl's organs of speech, and was desirous that others should examine them also.

About seventy years ago, our own country furnished us with another equally striking example of the same power, and which forms the subject of various papers in the Philosophical Transactions, drawn up chiefly by Dr. Parsons at the time, and printed in the volumes that were published between the years 1742 and 1747. It is the history of a young woman of the name of Margaret Cutting of Wickham-market, near Ipswich, in Suffolk; who, when only four years old, lost the whole of her tongue, together with the uvula, from what is said to have been a cancerous affection; but still retained the powers of speech, taste, and deglutition, without any imperfection whatever; articulating, indeed, as fluently and with as much correctness as other persons; and articulating, too, those peculiar syllables which ordinarily require the express aid of the tip of the tongue for exact enunciation. She also sung to admiration, and still articulated her words while singing; and could form no conception of the use of a tongue in other people. Neither were her teeth in any respect able to supply the place of the deficient organs; for these also were but few, and rose scarcely higher than the surface of the gums, in consequence of the injury to the sockets from the disease that had destroyed the tongue. The case, thus introduced before the Royal Society, was attested by the minister of the parish, a medical practitioner of repute, and another respectable person. From its singularity, however, the Society evinced a commendable tardiness of belief. They requested another report upon the subject, and from another set of witnesses, whom they themselves named for the purpose, and for whose guidance they drew up a line of categorical examination. This second report soon reached the Society, and minutely coincided with the first; and, to set the question completely at rest, the young woman was shortly afterward brought to London, and satisfied the Royal Society in her own person.

To explain this unexpected power, we should not only turn our attention to what is actually and in our own day accomplished by ventriloquists, but should recollect, that the tongue is only a single organ employed in the articulation of sounds, and that the fauces, nostrils, lips, and teeth, bear, at least, an equal part, while the glottis, which forms all the vocal or vowel sounds, is the chief organ of the whole. In reality, out of the twenty-four articulate sounds which fill up our common alphabet, the only two in which the tongue takes a distinct lead, are the *l* and *r*, though it is auxiliary to several others; but the guttural, or palatine, as *g*, *h*, *k*, *q*; the nasal, as *m*, and *n*; the labial, as *b*, *p*, *f*, *v*, *w*; most of the dental, as *c*, *d*, *z*; together with all the vowels, which hold so large a space in our vocabularies, are but little indebted to its assistance.

It is singular that so delicately sensible an organ as the tongue should receive the severest injuries, and submit to very violent operations, with less serious mischief than almost any other organ of the same size in the body. And it is on this account that the cruel and barbarous manner in which the tongue was extirpated by the ferocious tribes that overran Europe from the east formerly, was rarely productive of fatal consequences. Sir Everard Home published

many years ago, a paper upon this subject, containing various cases of sections of the tongue to a less or greater depth in consequence of diseased action. The operation was in every instance performed by the ligature. He does not state what effect was in any instance produced on the speech, and we are hence led to conjecture, that nothing in this respect occurred of material importance; but he draws the following conclusions:—The internal structure of the tongue is less irritable than almost any other organized part of the body. Its nerves appear to be more easily compressed and deprived of their power of communicating sensation, than nerves in general; and any injury done to them is not productive of diseased action in the trunk of the injured nerve. The tongue also has the power of throwing off its sloughs in a shorter time than any other part.

SPECIES II.

APHONIA ATONICA.

ATONIC DUMBNESS.

SPEECHLESSNESS FROM ATONY OF THE VOCAL ORGANS.

This atony is chiefly, if not altogether, confined to the nerves of the vocal organs, which may be injured by violence, or exhausted by mental or other commotion, independently of the occurrence of the disease occasionally as a symptom of paralysis, quinsy, or catarrh; thus furnishing us with two distinct varieties:—

α Oblæsa.	From lesion of the nerves of the tongue or glottis.
β Soluta.	From sudden or overwhelming commotion, or shock of any kind.

The instances of speechlessness produced by an injury of the lingual nerves are not common. But a division of the recurrent nerves, which are offsets from the par vagum, and distributed over the larynx and glottis, produces a speechlessness that is rarely, if ever, recovered from; for here the muscles belonging to the arytenoid cartilages, being rendered atonic or paralytic, can never be brought duly to contract again, the glottis remains permanently open, and the diameter of the larynx suffers no variety of contraction or dilatation. Galen seems to be the first anatomist who noticed this effect, or rather ascribed it to its real cause; for it was known, before his time, that, by making ligatures on the bloodvessels of the trachea, the noisiest animal is immediately struck dumb, and made quiescent. It was supposed that the state of the bloodvessels themselves, and not of the nerves included with them in the ligature, was the cause of this effect; that the blood became intercepted in its passage from the heart, and that the animal became mute because rendered comatose: and hence the name of carotids, or soporific vessels (from κάρος, *sopor*), was given to the arteries whose ligature was supposed to produce this very singular result. Galen, however, demonstrated very satisfactorily that the dumbness is, in this case, entirely owing to the pressure of the ligature on the accompanying nerves: and he afterward produced to his opponents two cases of boys, who in a greater or less degree had lost their voice in consequence of the recurrent nerves being cut by surgeons unacquainted with anatomy, in extricating strumous tumours from the neck. In the one case, only one of these nerves was divided, and the voice was merely much weakened, or about half destroyed; in the other, both were divided, and the voice was lost altogether. A whizzing senseless noise, indeed, remains in most instances, as Vezalius has correctly observed; but there is no vocal sound, articulate or inarticulate.

Where the speechlessness has followed upon an injury of some branches of the lingual nerves, we have numerous examples of recovery. In one instance the dumbness ceased suddenly, after the patient had been speechless for not less than ten years.—(*Sammlung*, 1721, ii., 406, 503, Bresl.)

In other instances, dumbness is produced suddenly, from a total exhaustion of nervous power in the vocal organs, without any organic lesion whatever. A sudden and overwhelming emotion of the mind from terror, anger, or any other passion, has frequently had this effect in irritable habits. So has a violent fit of hysterics, or any other vehement shock which* instantaneously deprives the nerves of their sensorial power, and the muscular fibres of their irritability: as a stroke of lightning, or a severe and unexpected blow on the stomach, will sometimes exhaust the vital energy of the entire system, and make life immediately cease. A sudden chill, as from drinking cold water during a violent heat, or the shock of a sudden fall, has frequently produced it, of which numerous instances are recorded in the Ephemerides of Natural Curiosities. Speechlessness of this kind has sometimes arisen from deleterious exhalations; from eating mushrooms; and in one instance, recorded in Hufeland's Annals, by repeatedly rubbing the wound made by a poisonous insect with saliva, and as often putting the finger to the mouth to obtain a supply of fresh fluid.—(*Dupau, in Journ. de Médecine*, Sept., 1789.) In like manner, Bonet informs us that the same effect has followed from putting into the mouth a piece of money cankered with the rust of verdigris.—(*Bonet, Sepulchr.*, lib. i., § 22.)

Where medical aid is required, our dependance must be on tonics, local or general, and topical stimulants. Blisters and masticatories have chiefly been made use of, and frequently with good effect; as has the vellication of a hair-brush contrived for the purpose. The dumbness has sometimes yielded to emetics, at others to electricity (*Krazenstein, Pr. Hist. res. Loquelæ par Elect. Hafn.*, 1753), and, in a few cases, to a cough (*Iperen. Abh. aus holl. Schriften*, b. i., p. 356; *Morgagni, De Sed. et Caus. Morb.*, ep. lxiii., art. 15); and occasionally the same, or a like violence which occasioned the

* Büchner, Miscell., 1729. Bartholin, Act. Hafn. i., Obs. 101, Schurig, Chilologia, p. 205.

disease, has removed it, and the cause has become the cure; as is reported of Athys, the son of Crœsus. In like manner, we have examples of its having yielded abruptly to a fit of anger, or terror; in one instance, to a fit of laughter (*Iperen.*, op. cit.); in another, to a blow on the head.—(*Ephem. Nat. Cur.*, dec. iii., an. v., obs. 236.)

SPECIES III.
APHONIA SURDORUM.
DEAF-DUMBNESS.

SPEECHLESSNESS FROM DEAFNESS, CONGENITAL OR PRODUCED DURING INFANCY.

The ears are as necessary to speech, or articulate sounds, as the tongue, or even the glottis; for, if such sounds be not heard, and distinctly discriminated, they can never be imitated. Persons who become deaf after a thorough acquisition of speech, do not become dumb, for the very reason that articulation has already formed a habit, and can easily be preserved by practice. But, if deafness be congenital, or take place antecedently to such habit, articulation can never be acquired afterward, unless, by some rare good fortune, the ears should acquire hearing; and the unfortunate individual can only receive and interchange ideas by the eye, through which medium, however, he may be taught written, though not oral language, and thus still, happily for himself, have his mind almost as richly stored, though not his ideas as readily communicated, as through the outlet of speech. Persons thus organically defective are denominated *sourds-muets*, or *sordi muti*, on the continent, and sometimes deaf-dumb among ourselves.

[In eastern courts, it has been usual from time immemorial to retain a number of mutes. These are not only employed to amuse the monarch, but also to instruct his pages in an art, to us little known, of communicating every thing by signs, lest the sound of their voices should disturb the sovereign. The mutes are also the secret instruments of his private vengeance.—(See *Edin. Med. Journ.*, vol. vii., p. 61.)]

This is an interesting subject, and not unconnected with pathological science, since it opens to us the only remedy that can be resorted to, where the defect before us, or that of deafness prior to articulation, is the subject of discussion. It is interesting also to us from the very considerable proportion o human beings which in all countries, and, apparently, in all ages, have been sufferers from this melancholy affection; a proportion that has been ingeniously calculated from a comparison of various tables, deduced from the extent of the disease in different parts of the world, as amounting to 1 in 2441 individuals.—(*Quarterly Journal of Foreign Med.*, vol. i, p. 319.) [In Germany, it is estimated that, in every million of people, one hundred are deaf and dumb; and, in the Danish dominions, the deaf and dumb amounted to 515 in the different bishoprics, whose population was only 820.621, according to returns, made at the first anniversary of the Copenhagen Institution for this class of afflicted persons. In Bornholm, the proportion was still greater.*—(*Allgemeine Literatur Zeitung*, June, 1807.)] And it is peculiarly lamentable to observe that, when the defect has once made an entrance into a family, whether from the influence it produces on the nervous system of the mother, or from any other less obvious cause, it is particularly apt to become common to those children which are born afterward: insomuch that we often meet with a third, or a half, and, in a few instances, where the first-born has been thus affected, with every individual of the progeny, suffering from the same distressing evil. "The late investigation in Ireland discovered families in which there were two, three, four, or more, thus circumstanced. In one family there were five children, all deaf and dumb; in another, seven; in another, ten; and, in that of a poor militia officer on half-pay, there were nine born deaf and dumb in succession."—(*Quarterly Journ. of Foreign Med.*, vol. i., p. 321.) Yet it is consoling to reflect that the defect is not always propagated to a succeeding generation, when the deaf-dumb have married, and even when both the husband and wife have been thus afflicted. [Still, it is said that such propagation is not uncommon (*Edinb. Med. Journ.*, vol. vii., p. 62), and, as deafness is, without doubt, often hereditary, the experiment of marriage should be carefully avoided.]

To pursue the calamity, however, into the various plans which the benevolence and ingenuity of the human mind have invented to supply the defect of speech, from the times of [Juan Pabbo Bonnet,† of Madrid], Ammanus of Amsterdam, and Wallis of our own country, to the wonderful degree of perfection attained under the Abbé Sicard, in the Royal Institution at Paris, would carry us far beyond the limits to which the present work must be confined. And I shall therefore only observe, that the grand principle laid down under almost all the

* According to a late census, the United States, with a population including slaves of 12,854,874, contain 7136 deaf mutes. The estimated proportion of deaf mutes to the population, as given in the *Troisième Circulaire de l'Institut Royal des Sourds Muets de Paris*, 1832, varies materially from that stated by Dr. Good. A census of 47,339,952 souls gives 29,853 deaf mutes; being about as 1 to 1585. Switzerland presents the greatest proportion of deaf mutes to her population, of any country in Europe. Reports from five cantons show, that of a population of 895,000, 1777 are deaf mutes; being nearly as 1 to 500. In the canton of Berne the proportion is as 1 to 350; while in the commune of Weyach, it is as 1 to 63. The number of institutions, in Europe and America, for the instruction of these unfortunates, as stated in the French report, is 128, at which about 3732 deaf mutes are pupils. For many interesting facts on this subject, see *An Address*, &c., delivered by Dr. Samuel Ackerly, formerly Physician and Sec. to the New-York Deaf and Dumb Institution, New-York, 1826.—D.

† Redution de las lettras y arte para ensennar a ablas los Mutos. En Madrid, 1620, 4to. The earliest known work on the subject of instructing the deaf and dumb.—Ed.

various plans and systems that have been devised, in order to obtain the proposed remedy, and supply the want of speech, is that of commencing with picture-characters, and making these the key to alphabetical and arbitrary signs: and, in this manner it is, that the eye is rendered subservient to the purposes of the ear. When the deaf-dumb scholar is made to understand that the picture of a knife or of a ship is to be regarded as the representative of such objects or ideas, there is no great difficulty in teaching him that the arbitrary letters of which these words are composed, and which for this purpose are always written or should be written underneath these pictures, are intended to stand for the same purpose as the pictures themselves, and to import the same objects or their ideas, whenever they are met with in a certain arrangement: and so of other pictures, and other combinations of letters which are equivalent to them. And hence, such combinations of letters, when the learners are accustomed to them, will as effectually become the signs or representatives of the objects they are intended to express, as the pictures which preceded their use. The power that appertains to each separate letter is a lesson to be learned long afterward; and still longer afterward an idea, for it can never be any thing more, of the vocal or articulate effects produced by different movements of the lips, cheeks, and throat, which that letter is designed to express.* An accurate and habitual attention, however, will teach the scholar this; and he will, in a considerable degree, be able to make out what is spoken by the motion of the lips and other vocal organs alone; and, if he possess a facility of copying these, he may be taught, still farther, how to measure and modulate them, so as to produce the articulations they are intended to convey, and to speak with tolerable accuracy, without hearing himself: while a fellow-scholar labouring under the same defect, and having made an equal progress in the same kind of education, will understand his meaning, or the vocal terms he conveys, by the mere movement of the vocal organs alone. I have myself borne a part in such conversations at that excellent institution of this metropolis, the Asylum for Deaf and Dumb Children, and have seen scholars conversing in this manner without hearing a single syllable on either side, but at the same time with a perfect understanding of each other's meaning.

Mr. Waller relates a singular case of this kind, in a man and his sister, who lived together to an advanced age, neither of them having the least sense of hearing, but who understood each other as well as other persons by the motion of the lips alone; supporting themselves by daily labour. They became deaf, however, when children, after they had learned to speak; and hence, in moving their lips, they continued to articulate, though not very distinctly.—(*Phil. Trans.*, vol. xxv., 1707, No. 312, p. 2468.)

[A curious account is given by Bishop Burnet of a girl at Geneva, who could hold a conversation in the dark, by laying her hand upon her companion's lips. The possibility of such a circumstance, it is said, has not been confirmed by subsequent experience. The mode adopted for conversing in the dark, is by writing the word intended to be communicated upon the palm of the hand, or the back of the neck, thus addressing the sense of touch, which, as well as that of sight, is rendered by attention and exercise wonderfully acute.—(*Edin. Med. Journ.*, vol. vii., p. 62.)]

I have said that the mode of commencing instruction in *almost* all the schools of the kind before us, is by pictures or other imitative signs, and that a knowledge of alphabetical characters does not take place till long afterward. The limitation is introduced, because in a few of the French schools in the present day, and particularly that at Bourdeaux, under the superintendence of the Abbé Gondelin and M. Gard, this easy and natural order is reversed, and the tutors have voluntarily loaded themselves with a very unnecessary difficulty, and their scholars with a useless and incomprehensible burden of many months' duration. For what reason the disciples of the Abbé Sicard, or of the Abbé de l'Epée, should thus intricately deviate from the plain and simple path of their masters, it is not easy to conceive.

The extent of knowledge, and even the expansion of genius, which the deaf-dumb have occasionally exhibited, are truly marvellous; of which, indeed, M. Gard himself, to whom we have just referred, is a striking example. This gentleman was born with the faculty of hearing, and only lost it in his seventh year of childhood: so that his mind must have become stored with a multitude of ideas, derived from the inlet of hearing, which he could not have acquired afterward. It is said that, in consequence of his deafness, he so completely lost the power of speech, as to forget even the commonest words that had been familiar to him. This feature, however, in his history seems to be considerably overcoloured; yet, it is well known, that he did not commence any plan of education till he was twenty-seven years old: from which time, such was the vigour of his mind, and the assiduity of his pursuit, that the able and professional critic, to whom I have just referred, affirms, "he is perfectly well informed upon all subjects which are usually studied; well versed in history, literature, politics, and languages. He has been taught Greek and Latin; and has, by himself, acquired the English language, of which he even showed us a grammar written for his own use. On presenting him with a printed report of one of our institutions, he immediately translated a part of it into French.—(*Quart. Jour. of Foreign Med.*, vol. i., p. 322, 1819.)

Yet it is well known, that there are several

* See the Abbé de l'Epée's Institution des Sourds et Muets par la voie des signes méthodiques, &c., Paris, 1776.

As also the Abbé Sicard's "Théorie des Signes, ou Introduction à l'étude des langues; où le sens des mots, au lieu d'être défini est mis en action," tom. ii., 8vo., 1808.

other scholars of the same school that have excelled even M. Gard; and who, having been born perfectly deaf, have been necessarily dumb, from the same period; of whom it may be sufficient to mention M. Clerc and M. Massieu. The last was literally taken from the plough, in the department of the Gironde, and was carried by a stranger, who happened accidentally to see him, and took compassion on him, to M. Sicard, at that time stationed at Bourdeaux. By dint of hard study, and a comprehensive capacity, he has also raised himself to the office of assistant instructer to M. Sicard, in the Parisian school, where he teaches the departments of syntax, history, geography, and *religion*. On one occasion, happening to be robbed, he pleaded his own cause in the court of justice; and when, during the French revolution, his revered master was put into prison, he addressed a letter of so much force and feeling to the President of the National Assembly, as to obtain his liberation.

There are a few instances on record of a recovery from deafness many years after birth, and of a gradual acquisition of speech in consequence hereof; chiefly produced by some violent but fortunate affection of the brain. Thus Lambzweerde relates the case of a fortunate fracture of the scull, through a fall from a considerable height, by which a young person, deaf-dumb from birth, was suddenly endowed with hearing, and, in process of time, with speech.—(*Append. ad Amœnit.*) In like manner, Mr. Martin gives an account of a native of Stratherig, near Inverness, of the name of Fraser, who was born deaf, and continued dumb till seventeen years of age, when he was attacked with a fever which affected his brain for some time; on recovering from this he began to have a sense of hearing, and soon afterward to understand speech, which he gradually imitated, and at length acquired, so as to converse fluently; though, from commencing at so late a period, he never attained perfect accuracy in articulating many words.—(*Phil. Trans.*, vol. xxv., No. 312, p. 2469.)

[Rosenmüller has dissected most carefully the organs of hearing and of speech in persons born deaf, but could discover nothing peculiar in them. As a means of cure, he has tried galvanism without success, and it has been tried by others quite as ineffectually. One child suffered acute pain during the application of the pile, and seemed to be benefited for a month, but afterward relapsed.]

Puncturing the tympanum has been recommended by M. Delear (*Journ. Complémentaire, Juin*, 1822); and in a few instances with ourselves, as well as abroad, it has succeeded. It is hence worth trying, though the success has been very rare.

[In 1825, the particulars of a deaf-dumb boy, to whom the faculty of hearing was first communicated when he was nine years old, were read to the Royal Academy of Sciences at Paris. The treatment from which this success was derived, consisted in injecting air and fluids into the tympanum through the Eustachian tube; a practice very commonly adopted by Dr. Itard. The boy, named Claude Honoré Trezel, had a physiognomy of little expression; the emblem of his understanding. He slodged and reeled about as he walked; could not even blow his nose; and made his principal wants known by signs. The first few days immediately following the first establishment of his hearing, were a period of ravishment to him. All kinds of noises gave him excessive pleasure; and, while listening to a musical snuff-box, he seemed in a sort of ecstasy. But it was some time before he could comprehend, that speech was a means of social communication. Hence, at first he did not attend to the sounds by which it was formed, but only to the movements of the lips. For this reason, he fancied that a child, seven years old, spoke exactly like grown-up persons. At length, however, he was taught, that the sounds were of more importance than the motions specified. In this stage of improvement, he unluckily happened to hear a magpie utter some phrases, and, generalizing from this particular fact, he inferred that all animals were gifted with speech, and he actually beat a favourite dog to make it pronounce "*papa*," "*du pain*," the only words he could himself speak.

These first advances in hearing produced a considerable alteration in the boy's physical state. His gait became firmer, his dull countenance assumed a smiling gay air, and he learned to blow his nose. A month passed away without much further improvement; and it was a quarter of a year before the lad could understand a few compound words, and the meaning of some plain short phrases. It was a good while also before he could ascertain the direction of sound. Hence, when a person concealed himself in his room, and called him, he had the utmost difficulty in finding out the place in which the speaker was hidden, and then traced it rather with his eyes and reason than his ears.

The earliest sounds which he acquired the power of forming, were low and grave; and the first words which he learned to speak were, "*papa, tabac, du feu*," &c. But when he wished to pronounce more complex words, he exhibited various contortions of his lips, tongue, and all the agents of pronunciation, the uses of which he was completely ignorant of; resembling in this respect a beginner in dancing or swimming, who exhausts himself by useless ungraceful efforts. At last he succeeded in pronouncing a few compound words which had previously baffled him. His progress continued, however, to be very slow; and he either skipped over many syllables, or pronounced them imperfectly. Perhaps, indeed, he would never have overcome this difficulty, had not the plan of instructing him through the sense of vision, instead of through that of hearing alone, been put in practice. Various syllables were now written down, and pointed out to him; and, from this period, his pronunciation improved fast, as he comprehended with greater clearness the assemblage of vowels and consonants, and their reciprocal influence. Here, as M. Magendie observes, we see a very remarkable fact: namely, that the

association of vision with the motion of the larynx was prompt and easy, while that of hearing with the organs of voice was always difficult, and but slowly acquired. Thus, when the boy looked at the written syllables, and they were pronounced near him, he could pronounce them himself; but if the writing were removed, the clearest pronunciation of certain syllables, close to him, did not enable him to articulate them himself.

By dint of the foregoing method, the boy learned to read and write tolerably fast; but, like persons who study a foreign language, and who generally learn to read and write it long before they can speak it, he still reads with his eyes, and writes infinitely better than he speaks. One curious circumstance is particularly recorded: whenever a word is distinctly pronounced to him, he immediately repeats it. For instance, when he is called, he never fails to repeat his name. When his preceptor tries to make him understand things, it is by gestures and looks; the means by which the boy himself most readily expresses his own ideas.

The improvement of his condition is wonderful: a year previous to the date of this history he was so deaf that he was insensible of the loudest explosions; he now hears all noises very well; knows whether they come from a distance; can distinguish their nature; gets out of the way of carriages and horses, and runs to open the door when it is knocked. He relishes music, and understands and repeats by memory certain phrases within his compass, and gives answers to them. He is also able to do what his tutor directs him to do by words, though he cannot yet do this with other persons.

Finally, as M. Magendie observes, when it is reflected how much the boy must have learned to attain his present improved state; what new ideas and combinations must have taken place in his mind; what instinctive associations must have been formed between his ear and understanding, between this and his organ of voice, and his ear and his larynx, there is every reason to hope that his moral and physical state will yet continue to receive further melioration.—(*Journ. de Physiol. Expér.*, tom. v., p. 223, &c.)]

GENUS V.

DYSPHONIA.

DISSONANT VOICE.

THE SOUND OF THE VOICE IMPERFECT, OR DEPRAVED.

VOICE, as we have already observed, is the sound of the air propelled through, and striking against the sides of the glottis: while speech is the modification of the voice into distinct articulations, by means of particular muscles in the cavity of the glottis itself, or in that of the mouth or the nostrils, employed as signs of ideas. Hence, voice belongs to many animals in common with man: speech, thus limited as to its object, belongs to man alone: for no other animal can distinctly articulate, and make use of articulations, as signs of what is occurring in the mind: though a few animals may be taught to imitate articulate sounds without having ideas attached to them. The present genus embraces the morbid affections to which the voice is subject; the next, those which appertain to the speech. It includes three species:—

1. Dysphonia Susurrans. Whispering Voice.
2. ——— Puberum. Voice of Puberty.
3. ——— Immodulata. Immelodious Voice.

SPECIES I.

DYSPHONIA SUSURRANS.

WHISPERING VOICE.

VOICE WEAK, WHISPERING, AND SCARCELY AUDIBLE.

MANY of the causes of atonic dumbness, when operating with a less degree of violence, become causes of the present affection, while a few are peculiar to itself. The following varieties may not unfrequently be noticed:—

α Oblæsa.	From lesion of the nerves of the larynx.
β Pathematica.	From sudden emotion of the mind.
γ Compressoria.	From permanent compression of the trachea.
δ Catarrhalis.	From neglected catarrh.
ε Enervis.	From simple debility of the larynx, without any obvious cause.

Independently of which the present species is occasionally met with as a symptom in melancholic, paralytic, and hysteric affections, as also in quinsy, dysphagia, and catarrh.

The nerves which, when injured, chiefly produce whispering, are the recurrent. When these are divided, dumbness, as we have already observed, is the result; but they are often weakened, and, perhaps, otherwise injured, without being divided: and in this case the voice is not actually lost, but dwindles to a whisper, and is recovered as soon as the nerves resume their tone. The voice has, in this manner, frequently been injured by straining the ligaments and the minute muscles which move the parts of the glottis on each other; and in elevating the voice to a high pitch in public addresses, or striving at a note in singing which the natural compass of the voice will not reach. So Pliny tells us, that the voice of Gracchus, during a violent exertion in speaking, suddenly sunk to a feminine treble. Astringent gargles, blistering the throat, cold local bathing, external and internal, with perfect quiet and silence, are the best means of recovering the voice under such circumstances. The last I have found most serviceable, and have made the patient gargle four or five times a day with ice-water, which, at the same time, should be applied to the throat with a wet napkin.

A sudden and overwhelming emotion of the mind from various causes, will sometimes totally choke or stifle the voice, which is particularly the case with rage: but, where the effect is not so violent, the voice becomes an almost inaudible

whisper, and particularly when the passion is fright or terror. Rest, and return of confidence, will usually restore it in a short time; but in some instances the effect has been permanent.

There are various cases in Morgagni and Bonet, in which the voice was rendered almost inaudible from the pressure of an enlarged heart, a bronchocele, or an aneurism of the aorta against the vocal avenues. Sauvages has referred to these; and it is highly probable that such a pressure, by diminishing the capacity of the trachea, may lower the power of the voice.

A catarrhal whisper is a frequent occurrence, and there can be few practitioners who have not met with examples of it. The voice is often injured from the commencement of the catarrh, as well in consequence of the inflammatory affection of the mucous membrane of the glottis, as of the increased secretion of mucus that issues from the interior of a great part of the trachea: and in some cases in which the inflammation had become chronic, by pulling forward the tongue, I have seen the epiglottis covered with a cream-coloured coating, which was probably extended lower, and was the chief source of the difficulty of utterance. But the variety before us is the result of that weakness which inflammatory action induces in the vocal organs, as a sequel, rather than a symptom, of the inflammatory action itself.

Mr. Archdeacon Squire relates a singular case of this kind in an attorney at Devizes, of the name of Axford, who, at twenty-eight years of age having caught cold, was seized with a hoarseness that in six days rendered him totally speechless; in which state he continued after the cold left him, being totally incapable of distinct articulation, and scarcely able to make the least inarticulate sound. Four years afterward, he got so much intoxicated as to fall from his horse several times on his way home; and was at last taken up by a neighbour, and put to bed in a house on the road. He fell asleep; and dreaming that he had fallen into a furnace of boiling wort, he was put into so great a fright, that struggling with all his might to call for help, he actually did articulate aloud, and recovered the use of his speech from that moment as effectually and perfectly as he had ever had it in his life.—(*Phil. Trans.*, vol. xlv., 1747–8, p. 148.)

For habitual hoarsenesses, leading to the present affection, the siliquosæ offer the best class of medicines; and, with respect to many of them, there is no great difference, except what results from their greater degree of acrimony. It is common to all these, on being swallowed, to stimulate the fauces, and especially their mucous glands, and thus to excite a more copious excretion of mucus. Of this family of medicines the *erysimum officinale*, or hedge-hyssop, was at one time in higher reputation for habitual hoarseness than any of the rest: and Dr. Cullen seems disposed to support this preference, chiefly upon the ground of its being less violent in its stimulant power than the generality of them. He recommends the juice of this plant, mixed with an equal quantity of sugar or honey into a sirup. And where the erysimum is not at hand, he recommends its place to be supplied with a sirup of horseradish, but made weak, so that it may be frequently used, or long continued, without rendering the fauces sore or uneasy.—(*Mat. Med.*, part ii., class v., p. 166.) For this purpose, a drachm of the root, fresh and scraped, may be infused in four ounces of boiling water for two hours in a close vessel, and made into a sirup with double its weight of sugar. Of this a tea-spoonful, swallowed leisurely for a dose, will often be found highly serviceable.

We sometimes meet with a debility in the organs of the voice which reduces it to a whisper, without being able to ascribe it to any particular cause.* This is often temporary, and seems to occur from a sudden deliquium of nervous power in these organs; as when, in the middle of speaking or reading, and this too in an agreeable tone, the voice abruptly fails, and is as abruptly resumed. In the case of the orator Gracchus, to whom I have just adverted, Pliny informs us that the voice was restored by the sound of a pipe, that, being struck by his servant, gave the proper pitch. In some instances, however, this failure of the voice has been more or less permanent or intermissive. I had lately a lady under my care, of about forty-five years of age, who was usually attacked in sudden and irregular paroxysms, each continuing for several weeks. Repeated blisters, stimulant astringent gargles, as of port-wine or alum-water with tincture of myrrh, and a steady perseverance in a tonic regimen and pure country air succeeded. She recovered by degrees the full power of her voice, which, during the paroxysms, was nothing more than a weak and almost inaudible whisper; and has had no return of the affection for several years. In another case of the same kind, adverted to in the Nosology, the same plan proved less successful. The patient was a gentleman of about forty years of age, otherwise in good health, who had never spoken, except in a whisper, for more than eight years. [Electricity, galvanism, and tonic medicines might be tried; and, in a few examples, the editor has known the application of strong liniments, blisters, and antimonial ointment to the integuments covering the larynx, give the voice its proper strength.†]

* A variety of aphonia sometimes arises from the long abuse of mercury in cases of this kind. For the cure of this, an alterative and tonic mode of treatment should be pursued. Dr. Francis has found stimulating gargles and the free use of the alliaciæ to be useful in restoring the functions of the parts.—D.

† Dr. Elliotson refers in his lectures to a species of aphonia, in which the voice is sometimes lost, or reduced to a mere whisper, without any inflammation, œdema, or obstruction of the parts. It occurs chiefly in females, and is regarded altogether as a nervous complaint. Frequently it comes on suddenly, and ceases in the same manner, and is sometimes accompanied by other nervous affections. The shower-bath, and attention to the general health, are the means of relief advised by Dr Elliotson.—Ed.

SPECIES II.
DYSPHONIA PUBERUM.
CHANGE OF VOICE. VOICE OF PUBERTY.

THE VOICE DISSONANT AND UNTRUE TO ITSELF, IRREGULARLY ALTERNATING FROM HARSH TO SHRILL: CONFINED TO THE AGE OF PUBERTY.

THE change that, during the period of puberty or adolescence, takes place in the sexual system for the purpose of giving perfection to its organs, is well known to be connected, by sympathy, with an equal change in various other parts of the body. In females, the breasts assume a soft and beautiful swell, and the nipples a pleasurable irritation. In males, the chin is covered with a beard, and the voice becomes fuller, deeper, and more sonorous. Before the voice, however, acquires this important change, it often exhibits great irregularity; and the youth, incapable of modifying his own tones, passes abruptly from harsh to shrill, and from grave to acute. And it is this irregularity and uncontrollable dissonance of voice, which constitutes the present species.

There is no great difficulty in accounting for this abnormal state of the voice, at the period before us. The glottis is nearly as complicated in its structure as the eye or the ear, and the modulation of its tones depends upon an equal degree of elasticity and pliability in all its moveable parts, and in their perfect submission to the authority of the will. To the attainment of a correct voice, it is necessary that there should be great accuracy of ear; a perfect symmetry of the vocal organs; equal tenseness in the ligaments of the larynx, which must be also nicely balanced by the powers of the muscles on each side; the cartilages of the larynx must be delicately adjusted to each other; the lateral cavities equally deep, and the cornua of the os hyoides of a like length. With such an organization, the voice is perfected for exact modulation in speaking or singing; and it is from different defects in this requisite mechanism, that some persons cannot speak, and others cannot sing in tune.

Now in the change that takes place during puberty, every part does not always harmonize with the rest; some parts become more tense, others less, and yield more easily; some are more relaxed, others more contracted; and of the effect produced by such a state of the glottis, a tolerably distinct idea may be formed from a remark of Dodart, that a variation in the capacity of the glottis, not exceeding the fifty-fourth part of a silkworm's thread, or one three hundred and fifty-fourth part of a hair, will occasion a difference of tone. Time, however, and repeated exercises of the will, usually triumph over these discrepances, wherever they exist, in a few months; when the voice recovers its unity of tone, and becomes graver in proportion as its motive powers become firmer and denser; and hence the reason why the voice of males is graver than that of females. In males, also, the glottis becomes more capacious, which forms another cause of gravity of tone. The deepest tones are struck by animals that have the largest glottis, as the phoca, the ox, the *ardea stellaris*; while singing-birds which sound the acutest tones, have a glottis capable of the closest contraction. The deepest roarings are produced by animals that have the cartilages of the trachea entire, or imbricated, or tesselated with bones, as the lion, the elephant, and the peacock.

SPECIES III.
DYSPHONIA IMMODULATA.
IMMELODIOUS VOICE.

THE VOICE PERMANENTLY DEPRAVED, OR INHARMONIOUS.

THIS species offers the six following varieties:—

α Rauca. Rough or harsh voice.	The voice naturally or habitually hoarse, harsh, or rough.
β Nasalis. Speaking through the nose.	The voice sent with a cracked and grating sound through the nostrils.
γ Clangens. Squeaking voice.	The voice shrill and squalling.
δ Sibilans. Whizzing voice.	The voice accompanied with a whizzing or hissing sound.
ε Stertens. Guttural voice.	The voice accompanied with a snorting, snoring, guttural, or stertorous sound.
ζ Palatina. Palatine voice.	The voice hoarse, obscure, indistinct, with a fissure, or other defect, in the palate.

Of most of these, the cause will be obvious from the observations already offered. Thus the squeaking voice proceeds ordinarily from too narrow a glottis; the rough or harsh voice, from a glottis too wide, and not sufficiently moistened with mucous secretion. In the whizzing voice there is too much secretion, but of too limpid a consistence.

The guttural, or stertorous variety is commonly the result of a relaxed glottis, or velum palati, with an accumulation of thickened mucus; and here local stimulants, astringents, and tonics, together with a steady and determined exertion to obtain a modulated voice, will frequently prove successful. If we put out of consideration a few cases, in which some fissures in the palate have been cured on the principles applied to the harelip, the obscure palatine voice, commonly congenital, but sometimes a sequel of lues, can only be assisted by filling up the fissure in the palate with a silver plate, properly secured by a spring, or, when necessary, by an entire false palate of the same metal. Yet the most dexterous artist will sometimes find his ingenuity unavailing, and the defect beyond his skill. The nasal voice is produced ordinarily by an obstruction of the nasal fossæ from condensed mucus, as in a cold of the head, a polypus, or some other organic defect; the remedy

or removal of which, where this can be attained, will restore the voice to its proper clearness. In common language, we denominate this variety *speaking through the nose*, but most incorrectly; for it is occasioned alone by our not having the nasal passages clear; and consequently from not being able to speak through them with our usual facility.

This last is often the result of affectation, or a foolish habit, not easy to be conquered when once acquired.

GENUS VI.
PSELLISMUS.
DISSONANT SPEECH.

THE ARTICULATION IMPERFECT OR DEPRAVED.

In the preceding genus the imperfection or depravity exists, not in the articulation, but in the sound of the voice; whence the distinction between that and the present is clear. Psellismus embraces two species; that of STAMMERING, and that of a VICIOUS ENUNCIATION.

1.	Psellismus Bambalia.	Stammering.
2.	——— Blæsitas.	Misenunciation.

SPECIES I.
PSELLISMUS BAMBALIA.
STAMMERING.

THE FLOW OF THE ARTICULATION DISTURBED BY IRREGULAR INTERMISSIONS OR SNATCHES.

This affection may be regarded as a sort of clonic spasm, or St. Vitus's dance, confined to the vocal organs, and offers us the two following varieties:—

α	Hesitans.	Hesitation.
β	Titubans.	Stuttering.

In the HESITATING VARIETY, there is an involuntary and tremulous retardation in articulating peculiar syllables. The organs are generally too mobile and unsteady, and the will has lost its control over them, if it ever possessed any. By reverting to the remarks made on *Dysphonia puberum*, the physiology of the affection will be easily understood. As bad habits are more easily learned than good ones, because they are more striking, and more strongly arrest the attention, this complaint is often caught by imitation, and especially among children; who, for this reason, ought never to be intrusted in the company of a stutterer, till their speech has become steady and confirmed.

In the SECOND VARIETY, we have a higher degree of stammering than in the first; accompanied with more impetuosity of effort. It consists in an involuntary and tremulous reduplication of some syllables, alternating with a tremulous hurry of those that follow. "I would thou couldst stammer," says Shakspeare, with a striking illustration of this morbid affection, "that thou mightst pour out of thy mouth, as wine comes out of a narrow-mouthed bottle, either too much at once, or none at all."

The convulsive actions of the muscles of the glottis, and which are communicated to the other organs of speech, whether productive of the present or the preceding variety, may often be overcome by a firm and judicious discipline; insomuch that some of the most distinguished orators of both ancient and modern times are well known to have been subject to this affection in their youth. In ordinary conversation, or where a man has time to pick out single words, instead of speaking whole sentences, the stammerer always hesitates most; and hence always least where his attention is completely engrossed. On which account, there are many stammerers that scarcely utter a word in speaking without betraying themselves, who nevertheless sing, and enunciate the words of the song, without any hesitation whatever, their whole mind being led away with the tune, and a strong desire to keep in time and harmony; while there are others who hesitate as little in reading, the words being immediately before them, and their attention being swallowed up in the subject. One of the worst stutterers I have ever known was one of the best readers of Milton's Paradise Lost. He was a scholar of considerable attainments, and had taken some pains with himself for his natural defect, but without success; yet the moment an interesting poem was opened, his defect completely vanished, from his being led captive by the force of the subject, and the great interest he took in this branch of polite letters.

This affords us one means, therefore, of remedying the evil before us; the stammerer should learn by heart and repeat slowly whatever most arrests his attention. But, at the same time, the will must learn to obtain a control over the muscles of articulation; and, for this purpose, single words should be uttered for hours at a time deliberately, and when alone; and perhaps too, as was the custom of Demosthenes, a practice of haranguing by the seashore, or on the brink of some awful waterfall, where the fearful noise and the magnificence of the scenery have a tendency to break in upon the habit, and render the conquest the easier, may be often found advantageous. It would at least stimulate the speaker to strain his voice to the full extent of its power, and thus fit him for public speaking before large bodies of people, where a loud and elevated voice can alone be heard distinctly; which was probably the chief object Demosthenes had in view; for we are expressly told, that his voice was weak, as well as his speech tremulous and hesitating. Adults who have firmness and perseverance enough for the purpose, may undertake the task of disciplining themselves; but children should always be put under the care of a judicious tutor, whose best qualifications will be patience and good temper. A very few words only should be marked down at a time for trial, and these should be attempted separately; nor should a second lesson be entered upon till the first has been completely mastered, although the effort should demand many weeks, or even months. An acquisition of one lesson will always facilitate that of another.

[Dr. M'Cormac (*Treatise on the Cause and Cure of Stammering*, Lond., 1828, 8vo.) con-

ceives, that the cause of stammering arises from an attempt to speak while the lungs contain an insufficient quantity of air. This habit, he says, is acquired from undue haste and imitation; and the successful method of treatment consists in making the patient always inhale a proper quantity of air into the lungs before he attempts to speak, and to direct him always to pronounce very slowly, until the bad habit is broken. When the patient stutters very much, the practice of making long inspirations and expirations is stated to be a good preliminary exercise. The main thing to be attended to, and what in fact is the groundwork of the whole system of cure (Dr. M'Cormac says), is to expire the breath strongly each time when attempting to speak, the lungs being previously filled to the utmost. As it will be some time before the patient can husband the air of his expirations, so as to say all he would wish in one breath, he must not commence by repeating sentences during each expiration, but only simple monosyllabic sounds. During the intervals, all conversations should be avoided, until the cure is somewhat advanced. It appears to the editor, that although the practice here inculcated is unquestionably right, the theory on which it is founded is not altogether so free from doubt. While the practice recommended by Dr. M'Cormac comprises slowness and deliberation, which are, indeed, indispensable parts of it, the theory of the lungs not having air enough in them, and of this being the cause of the infirmity, may not be correct. The voice of some stammerers whom the editor has known, has been so strong as scarcely to justify such a conclusion; and he is still inclined to believe, that a want of proper control over the muscles concerned in articulation, must be regarded as the chief cause of the present affection. At the same time it must be granted, that the attempt to speak while the lungs have so little air in them, that an interruption will arise from the necessity of a fresh inspiration, cannot fail to embarrass a person addicted to stammering. The practice inculcated, therefore, is in every respect commendable, and the suggestion of it highly meritorious.]

SPECIES II.

PSELLISMUS BLÆSITAS.

MISENUNCIATION.

ARTICULATE SOUNDS FREELY, BUT INACCURATELY ENUNCIATED.

THE elementary articulate sounds which the organs of speech are capable of enunciating are but few; and hence they are the same in all languages, which are alone founded upon them: differently, indeed, modified in several of them, and with a difference of number in still more; for diversities of language consist, not in different sets of articulations, to which the vocal organs are not competent, but only in their different modes of combination, and the different ideas which such combinations indicate. So seven notes comprise the whole of music, and by their different arrangements, produce that variety of harmony which we admire in the works of Handel or Mozart. If we would ascend higher than eight notes, we only commence another series of like proportions. In the same manner, to quote the words of the author of Hermes, "it is only to about twenty-four plain elementary sounds that we owe that variety of articulate voices, which have been sufficient to explain the sentiments of so innumerable a multitude as all the present and past generations of men."—(Book iii., chap. ii., p. 324.)

The twenty-four plain elementary sounds here referred to, are those which are denoted by the letters of the greater number of our European alphabets. Yet, of these, many are rather mere modifications of other sounds than distinct sounds in themselves; insomuch that the ingenious Wachter has endeavoured to reduce the twenty-four to ten primary articulate enunciations, and to show that these alone would be sufficient for the purposes of the most polished languages; and, consequently, that an alphabet of not more than ten marks or signs might be sufficient to express its entire range.* In making this reduction, he regards all the five vowels as modifications of each other, or rather of one common articulation, the simplest belonging to the organs of speech, formed with least difficulty, and, on this account, composing a very great part of the languages of savage nations. In like manner, he regards all the gutturals as only modifications of another common articulation, as K, C, CH, Q, G, H. So B and P have nearly a common sound; as have D and T; and PH, V, and W. While L, R, S, M, and N, are distinct articulations, and will not readily blend with any others.

These, no doubt, might be sufficient for all the purposes of speech; for we find that ten simple numerals are adequate to all the purposes of arithmetical calculations, which extend to infinity; and that able mathematician Tacquet, who has worked the problem for the purpose, informs us, that the combinations capable of being produced by the ordinary series of twenty-four letters, amount to not less than 620,448,401,733,239,439,360,000, without any repetition.—(*Arith. Theor.*, p. 517, *edit. Amst.*, 1704; *Astle, ut suprà*, p. 20.) So that the richest vocabulary has made but a small inroad into that inexhaustible mine of wealth which the wisdom of Providence has bestowed upon the few distinct and primary sounds, be they more or less, which the vocal organs of man are capable of articulating; thus devising a plan, which is equally entitled to our admiration for the simplicity of its design, and the comprehensiveness of its power.

I have observed, that some languages have more elementary sounds than others; and as these are expressed by elementary characters or letters, it follows, that some languages must also have a more extensive alphabet than others. The proper Phœnician alphabet, which is, perhaps, the oldest of which we have any distinct

* Nat. et Script. Concord., p. 64; Astle, Origin and Progress of Writing, p. 20

account, seems to have consisted of not more than thirteen letters at first; it had afterward three added to it, making sixteen in the whole; and, in this state, it seems to have been earliest employed by many of the adjoining countries, and is distinguished by the name of the Samaritan, or ancient Hebrew: for the terms and characters of this last are so nearly those of the Phœnician in its improved form, that it is difficult and altogether unnecessary to make a distinction. The Chaldeans introduced some change into the shape of the letters, rendered them more elegant, and added six other letters, as the Samaritan alphabet did not seem sufficiently full to express all the articulations of their speech; and the Jews, during the Babylonish captivity, readily adopted the improvement, and have continued the Chaldaic characters in their writings ever since. And, in this manner, with various changes and augmentations, the Phœnician alphabet can be traced through every part of ancient and modern Europe, every region of Africa where writing of any kind is current, and the western countries of Asia.

Over a very extensive portion of this last continent, however, we meet with an alphabet that has no common origin, or conformity of principle, with any hitherto described. This is the Nagari, or Devanagari, as it is called by way of pre-eminence. It consists of not less than fifty letters, of which sixteen are vowels, and thirty-four consonants, all arranged in the order of the alphabet, with a systematic precision that is to be found nowhere else. The vowels take the lead, beginning with those most easily uttered, and terminating with those that approach towards a consonant sound. The consonants then follow, in five regular series of gutturals, compounds, palatines, dentals, and labials; the whole closing with letters symbolical of sounds that do not exactly enter into any of the preceding series, and which may be regarded as a general appendix. This alphabet is asserted by many learned Bramins to be of a higher antiquity than any other; and there can be no doubt that it has a just claim to an exceedingly remote date. But its very perfection is a sufficient confutation to its having been invented first of all. Something far more rude and incondite must have preceded, and paved the way for it: and, in the complex characters of which it consists, we seem to have the relics of those emblematic or picture-symbols, which, there can be little doubt, were first made use of; which are still employed by the Chinese and the uncivilized tribes of America, and seem to have laid a foundation for alphabetical characters in every quarter of the world. With a few trivial variations, this correct and elegant alphabet extends from the Persian Gulf to China; but it has no pretensions to rival the antiquity of the Phœnician. It is unborrowed, but of later origin.

Whatever be the number of simple articulations that enter into the constitution of a language, or however modified in enunciation, they can only be learned with accuracy in early life, when the vocal organs are most pliable, and the untutored infant is most prone to imitation. And hence, unless care be taken to imprint upon the organs of speech a just and correct enunciation of the first elements of words at this time, it is with great difficulty that the art can be acquired afterward. This occurs to us under the best and most favourable circumstances. Foreigners coming into our own country after the age of thirty, though urged by an ardent desire of speaking English, seldom pronounce the language tolerably. An Englishman at the same age can hardly be taught to utter the guttural sound which the Welshman gives to the Greek χ, or even the French sound of the vowel *u*: and of the stray and solitary savages that have been caught in the forests of Lithuania, and a few other regions, there is not, perhaps, a single instance of their having been able, after the age of manhood, to articulate any language, so as to be understood with facility.

But we sometimes meet with less favourable circumstances to an acquisition of proper articulate sounds, and this too in a state of childhood, which is the immediate age of imitation. For, firstly, we sometimes see children, brought up under the care of those who have a vicious articulation themselves, from whom they will be sure to catch it; and hence those pronunciations and rude dialects that are so frequently found in the remoter and less polished districts of almost every extensive people. Secondly, we occasionally meet with some natural disability or want of harmonious power in the organs of speech themselves; one or two of them evincing a greater mobility than the rest, and consequently taking the lead of them, and interfering with their office. And, thirdly, there is, not unfrequently, a defect of structure in the organs of articulation, as a want or loss of the fore teeth, or a fissure in the palate or the lips.

Many of the articulate sounds, moreover, in most, perhaps in all languages, though called simple, are produced by the joint exertion of two or more distinct organs: and unless these organs precisely accord in flexibility and power, and are equally under the command of the will, the sound will be imperfectly imitated. The Arabic ث and the Saxon ð or þ, in English expressed by *th*, is an articulation of this kind, being compounded of a dental and an aspirate or guttural sound. From early habit, the natives of both countries are able to enunciate it perfectly, and they enunciate it alike. But there is scarcely an individual in any other country, who can ever be taught to sound it accurately, unless he should have an opportunity of trying it in early life; for the motive powers concerned in the sound will not move in sufficient unison. For the same reason, it is as difficult for a foreigner to catch the German *ch* in the pronoun *ich*, the *sch* in *schätzen*, or both in *schädlich*, or *schmächtigkeit*. But even these combined sounds have sometimes shades of distinction which constitute other sounds, and are expressly intended to do so; and, in such cases, the difficulty of an accurate enunciation is

greatly enhanced. Thus the English *th* in *thing*, and in *thou*, is a different articulation; and the Arabians, who have both, express them by different marks or letters; for the sign of the first mode is ث and of the second ض, which, if expressed by our own letters, would, perhaps, be best written *dth*. And it is on this account, that where a common language spreads over different countries, as the Arabian, or different parts of a country, which formerly made use of a diversity of tongues, as the English, varieties will necessarily take place in the utterance; and the dialectic may be more in favour than even the original or normal enunciation. There are some persons who prefer the English of Edinburgh to that of London; and the Arabic of Delhi, Ispahan, and Constantinople, has modifications of sounds as well as of inflections, which, though regarded as barbarisms by a native of Cairo, are contemplated as excellences by those who make use of them.

The organ chiefly employed in the articulation of sounds, is the glottis; and subordinate to this are the fauces, the nostrils, the tongue, the lips, and the teeth. And hence the division of articulate sounds into VOWEL or VOCAL, which are formed by the glottis alone, and are the simplest of all sounds; GUTTURAL, or those which are formed in the fauces more or less acting conjointly with the glottis, of which the fauces are only a continuation, as *h*, *ch*, *q*, *g*, *k*; NASAL, as *m*, *n*, and the compound *ng*; LINGUAL, as *l* and *r*; LABIAL, as *b*, *p*, *f*, *v*, *w*; and DENTAL, as *c*, *d*, *t*, *z*.

If we were to be more particular than we have time to be, or than is necessary, it would not be difficult to derive very numerous examples of vicious enunciation, and consequently varieties of the species of morbid utterance before us, from every one of these divisions; but the following are the chief which occur in our own tongue, and those that are cognate with it:

α	Ringens.	Vicious pronunciation of the letter R.
β	Lallans.	Vicious pronunciation of the letter L.
γ	Emolliens.	Vicious substitution of soft for harsher letters.
δ	Balbutiens.	Vicious multiplication of labials.
ε	Mogilalia.	Vicious omission of labials, or exchange for other letters.
ζ	Dentiloquens.	Vicious employment of dentals.
η	Gutturalis.	Vicious pronunciation of gutturals.

The VICIOUS PRONUNCIATION OF THE LETTER R is produced by a harsh or aspirated vibration or redoubling of it. Examples of this inelegance are common to several of the northern provinces of our own country, as it is to the ruder provinces of France. Among the Greeks, from the letter ρ (*ro*), it was denominated rotacismus, and was common to the Eretrienses in the Island of Eubœa. It is generally ascribed to the possession of too large and tardy a tongue. But it is rather produced by pressing the point of the tongue downward towards the root of the teeth of the lower jaw, instead of upwards, with a slight vibration towards the palate.

In the SECOND VARIETY of vicious enunciation, the letter *l* is rendered unduly liquid, or substituted for an *r*. As when delusive is pronounced deliusive, as though the *l* possessed the power of the Spanish *ll*, or the Italian *gl*; or as when parable is pronounced pa*l*able. Alcibiades is said to have laboured under this defect. The Greeks, from the letter λ (*lambda*), denominated this *lambdacismus*; the Romans, with more severity, *lallatio*, or *lullaby-speech*. This is often the result of affectation; sometimes, perhaps, from not having the tongue sufficiently free, as where there is too great a breadth of the frænum which ties it to the base of the mouth, or too large and oppressive a flow of saliva. As the articulation of *r* does not enter into some languages, as those of Mexico and China, the *l* is often substituted for it; hence the Jews of the former country, who, from long disuse, have lost the power of pronouncing the *r*, employ the *l* in its stead; and for אשרי האיש אשר in the opening of the first Psalm, read אשלי האיש אשל.

In the NEXT VARIETY, the harsh letters are viciously dropped for softer; as in the substitution of an*z*el for an*g*el; capi*d*ol for capi*t*ol; *d*at for *th*at. This may be the result of a debilitated articulation in children who have been brought up too daintily; but it is more usually the result of affectation; or is founded upon a general principle of softening the rougher or harsher sounds of a language into a smoother and more limpid flow; as is the case with most of the modern dialects of the south of Europe, and particularly those of Italy and Spain, which are well known to be derived from the Latin. Thus, in the former, we have piano for p*l*ano; pi*a*ngere, and still further pi*agn*ere, for p*l*angere, and e*gl*i for i*ll*e: and in the latter *fl*amar for *c*lamare; *fl*aga for *p*laga, and *h*ermosa for *f*ormosa.

It is curious to observe how, in this respect, the most barbarous and the most polished languages agree. It is generally, but erroneously conceived, that the former are peculiarly harsh and dissonant; for savages, in speaking, as in any other exertion, take no more pains than are absolutely necessary, and hence content themselves with the soft and simple vowel sounds, or those of the glottis, drawled out indeed at too great length; and when they are driven to the use of consonants, select those that give them least trouble to enunciate. On this account Lord Monboddo is correct in observing, that "the words of barbarous languages are long, and full of vowels; not short, and full of consonants, as has been imagined."* And the following remark of my excellent and distinguished friend, Dr. Perceval, of Dublin, in the manuscript commentary with which he favoured me

* Origin and Progress of Language, second edit., vol. i., b. iii., p. 496.

on the volume of Nosology, already spoken of in the Preface, is peculiarly in unison with this statement :—"In a paralytic affection of the organs of articulation, the patient pronounced the word cocoa, *toto*. The Otaheitans call Cook, Toote. Their language is beautifully soft and vocal. A sentence, reported in Cook's second voyage, is distinguished by the harmonious and expressive collocation of its words : 'Tootaha, taio Toote—mutte Tootaha.'—Tootaha, the friend of Cook—dead is Tootaha." Man, in savage life, is fond of ease, and would not move a muscle if he could help it : in the voluptuousness of polished life he loves it equally, and is, if possible, still less disposed to exertion : and hence this extraordinary accordance in the character of their articulations.

In the BALBUTIENT VARIETY, we have the labial letters too frequently repeated, or enunciated too harshly, or used instead of other letters. The Welch are proverbially addicted to this inelegance, by confounding the *v* with the *f*, and the *b* with the *p* ; of which Sir Hugh Evans, in the Merry Wives of Windsor, affords a correct and amusing example :—"*F*erry goo*t*," says he, "I will make a *p*rief of it in my note-book !" So impringe is often used for in*f*ringe, and i*b*ory for ivory. And thus *V*eda is pronounced *B*eda, and *V*enares *B*enares, in Bengal, the Bengalee having no such letter or articulation as *v*.

Infants, before they cut their teeth, are constantly using labials too freely, as the lips press together without resistance ; and hence they delight in iterating the same labial sound ; and it is from a copy of such infantile iteration, that we derive the names of pa-pa and ma-ma, which they first learn to utter : for the original Hebrew terms, from which these names have descended to Europe, and, indeed, to most other parts of the world, savage as well as civilized, are without any iteration whatever, being simply אב (*ab*) אם (*am*) ; the first importing *love*, and the second *sustenance ;* in Syriac rendered aba or abha, and ama ; and the same in Chaldee : whence the Greek terms and their correlatives, πάππα or πάππας and μάμμα (*pappa* or *pappas* and *mamma*), produced by a mere infantine balbutiation, or substitution of *p* for *b*, in the first term, and a reduplication of the consonant in each : and hence, too, *am-o* and *am-or*, in Latin.

Persons in a state of intoxication, from the tremulous debility of their lips, often exhibit the same reduplication of the labial sounds ; and thus make an approach towards one of the varieties of the last species. It is also often to be found in persons whose lips are unduly thick and broad, a deformity distinguished vernacularly by the name of blobber-lipped : to which cause Quintilian, who notices this variety of vicious expression, chiefly ascribes it, and hence distinguishes it by the name of plateiasma, probably from Theocritus (*Idyl.* xv., 88) :

Τρυγονες εκκναισευντι πλατυασδοισαι ατεντα.

"Cooing like pigeons with your blobber lips :"

A verse designed to ridicule the Doric dialect, and consequently intimating that this kind of vicious enunciation was common to a considerable part of Achaia.

The erroneous articulation constituting the NEXT VARIETY, is of a character precisely opposite to the preceding ; and consists in omitting the harsher labials altogether, or exchanging them for others that are softer and more easily uttered.

Thus *m*antle is broken down into *a*ntle, *f*ish into *v*ish, and *p*ilfer into *f*ilfer. So in the Spanish the Latin *f*arina becomes *h*arina, and *faba*, *hava*, and in French the Latin si*b*ilo, si*ffle*r. This blemish is especially common to those who are hare-lipped, or have any other kind of defect in either lip, so that the two will not play in harmony ; and more particularly still, if any of their front teeth be wanting.

In the DENTILOQUENT VARIETY, the dental sounds, as of *c*, *s*, *t*, *z*, are too frequently employed, producing the effect of what is called lisping, or in common language, speaking through the teeth. This, also, is often an affected blemish, as though it were an elegance, instead of a fault in enunciation. It is produced by having a tongue naturally too long, and hence perpetually thrust against the front teeth from necessity, and from a habit of pressing it in this direction too frequently.

The GUTTURAL or PALATINE LETTERS, as *g*, *h*, *j*, *c*, *x*, are sometimes uttered imperfectly, by being introduced where they ought not, or withheld where they should be distinctly enunciated ; and in this consists the last variety it may be necessary to notice.

One of the most common examples is in the superfluous use of the aspirate, or *h*, by means of which exalt and exasperate are pronounced ex*h*alt and ex*h*asperate ; so collar is called k*h*ollar, and custom k*h*ustom. And not unfrequently among men of unfinished education, the aspirate is just as uniformly omitted where it ought to be employed, as employed where it ought to be omitted ; whence for this sentence, "the upper part of the house is to be let unfurnished," we have "the *h*upper part of the ouse *h*is to be let *h*unfurnished." And if the palate be fissured, or in any other way imperfect, "ghost" is pronounced "host," "jolly," "iolly," or "yolly," "coffee," "dhoffee," "Xerxes," "Zherzes."

Where these defects depend on organic misformation, they will mostly be found without a remedy, though they may be palliated by a laborious discipline. Where they are the result of debility or vicious habit, the remarks with which we closed the preceding species will be equally applicable here.

ORDER II.

PNEUMONICA.

AFFECTING THE LUNGS, THEIR MEMBRANES OR MOTIVE POWER.

THE RESPIRATION IRREGULAR, IMPEDED, OR PAINFUL.

The idiopathic diseases that appertain to this order, differ very widely in their respective degrees of severity and danger; and, upon the whole, are but few; though the number is very considerable in which the lungs and their auxiliary powers are deeply implicated, by sympathy or continuity, in disorders that originate in other organs, and primarily affect other functions.

The genera are as follow:—

I. Bex.	Cough.
II. Dyspnœa.	Anhelation.
III. Asthma.	Asthma.
IV. Ephialtes.	Day-mare. Night-mare.
V. Sternalgia.	Suffocative Breast-pang.
VI. Pleuralgia.	Stitch.

GENUS I.

BEX.

COUGH.

SONOROUS AND VIOLENT EXPULSION OF AIR FROM THE LUNGS.

This genus of diseases was by the Latins named TUSSIS, a term that has been more generally employed by nosologists than any other. I have ventured, however, to restore the Greek name BEX (BHΞ) for the sake of uniformity; so that the generic terms may all be derived from a single tongue.

Cough, defined as above, is well known to accompany, as a symptom, a great multiplicity of other affections, some of which are very remote from the seat of coughing. Thus it occurs to us in pleurisy, in pneumonitis, hepatitis, paristhmitis, empyema, asthma, catarrh, phthisis, hæmoptysis, hysteria, helminthia, and dropsies of various species. Hence Dr. Cullen has omitted cough as an idiopathic affection, and has only introduced it as a symptom or synonyme of catarrh; although it belongs at least as much to phthisis, and perhaps to every one of the diseases just enumerated: but Dr. Cullen's system did not allow a place for cough as a primary disease; and in this, as in various other cases, he was obliged to bend to the force of necessity.

Cough, undoubtedly, occurs in its most frequent appearance as a symptom of some other complaint; but it is at times as truly idiopathic as any complaint whatever, and ought to be treated of as such. Under this form, its seat is in the chest; and the parts principally affected are the trachea, bronchiæ, the membranes, and substance of the lungs. In the act of coughing, the lungs, like the stomach in vomiting, continue inert; and the active or convulsive part, by which the lungs are emptied, is performed by the muscles of respiration.

"It is not necessary," observes Mr. John Hunter, "that the stomach should act violently to produce the evacuation of its contents; nor is it even necessary that it should act at all: for the lungs themselves do not act in the least when any extraneous matter is to be thrown up: and coughing is to the lungs what vomiting is to the stomach. The muscles of respiration are the active parts in emptying the lungs, and can act naturally and preternaturally. The action of vomiting is performed entirely by the diaphragm and abdominal muscles; and we know by the same action that the contents of the rectum can be expelled."—(*Anim. Economy*, p. 199.) In the Physiological Proem to the present class, I have endeavoured to establish this remark in respect to the lungs; and, under the species EMESIS, in the preceding class, I have noticed experiments of M. Magendie that confirm Mr. Hunter's opinion in respect to the stomach.*

Generally speaking, idiopathic cough is not dangerous in itself, or while running its regular course; but it has often proved highly dangerous in its results, by superinducing peripneumony, hæmoptysis, hectic fever, or phthisis.

The whole of these remarks apply not more to common coughs than to pertussis, or hooping-cough: which unquestionably, therefore, ought to be arranged as a species under the present genus. In truth, the commencement of both is in most cases so much alike, that it is often impossible, and always difficult, to distinguish them. Both are, in many cases, accompanied with a slight degree of fever; the most obvious and assignable cause of both is cold; I mean, where the hooping-cough is original; and in both, the sonorous fits, how much soever they may differ in violence and a few other circumstances, are produced by a spasmodic action of the same muscles.

Thus explained, the genus bex or tussis may be divided into the three following species:—

1. Bex Humida.	Common or Humid Cough.
2. —— Sicca.	Dry Cough.
3. —— Convulsiva.	Hooping-cough.

SPECIES I.

BEX HUMIDA.

COMMON COUGH. HUMID COUGH.

THE COUGH ACCOMPANIED WITH AN EXPECTORATION OF A MUCOUS OR SEROUS FLUID.

To this species the Greeks gave the name of anaptysis, and anacatharsis; which last has been copied by Sauvages, and appropriated to the present purpose. The species affords us four varieties; one entonic, or accompanied with an excess of power, and three atonic, or distinguished by enfeebled action.

α Mucosa.	Common mucous cough.
β Anhelans.	Chronic cough of old age.
γ Acrida.	Frothy saline cough.
δ Periodica.	Nervous cough.

In the FIRST VARIETY, the discharge is chiefly mucous, and excreted freely. The exhalants

* The opinions of various other physiologists on the mechanism of vomiting will be found at p. 27, and 93, of the present vol.

of the bronchiæ are stimulated by an irritation of some kind or other, frequently by a reverse sympathy, in consequence of cold and torpid feet, to act more powerfully than in a state of ordinary health, whence the bronchial vessels become overloaded, and relieve themselves by an expectoration, that takes place freely, and without the hoarseness which usually accompanies catarrh, or any other very troublesome disturbance of the respiratory organs.

There is another variety, commonly called the CHRONIC COUGH OF OLD AGE, which occurs in long paroxysms, with a viscid and mucous discharge, excreted with difficulty and laborious breathing. Here the bronchial secretion of mucus is perhaps less copious than in ordinary health; and, being peculiarly tenacious, is thrown up with great labour and repeated efforts. This kind of cough is particularly common to persons in advanced life; or whose lungs, or bronchial vessels, are rendered weak and irritable from a neglect of common mucous coughs; which have at length run into the present variety, and become almost habitual; showing themselves on every change of the atmosphere; and particularly during the inclemency of winter.

In the THIRD, or ACRID VARIETY, the fluid coughed up is thin, frothy, and saline; and for the most part excreted with difficulty. It is evidently, like the last, an atonic affection of the lungs; though often produced by diseased action in some remote organ with which the lungs associate. It is hence sometimes found in transferred gout, and still more frequently in cases of diseased liver; especially where the liver has been affected from a habit of ebriety; and, in these cases, it is peculiarly troublesome on first rising from bed in the morning. There is, as I suspect, in this form of humid cough, not only great torpor and imbecile action in the mucous membrane of the lungs, but a depraved secretion, small in quantity, and thinner and more acrid in quality than it ought to be.

This cough is sometimes extremely pertinacious. Dr. Darwin tells us that he met with it twice in the same person, at a distance of some years, during a fit of gout, so intractable as to resist venesection, opiates, bark, blisters, mucilages, and all the usual methods. It was, for a time, supposed to be the hooping-cough, from the violence of the spasmodic fits of coughing: it continued two or three weeks, the patient never being able to sleep more than a few minutes at once during the whole time; and never for a moment, unless propped up in bed with pillows.—(*Zoonom.*, Class iv. ii., 1, 9.)

There is another variety of the present species to be met with, which developes a striking tendency to recur at STATED PERIODS. The cough, instead of being violent, is here partly restrainable, and the discharge, though thin, is not acrid. It is the NERVOUS COUGH of Dr. Whytt, who, in his Treatise on Nervous Diseases, has described it with great accuracy and judgment. It is a frequent attendant upon persons of a nervous or irritable temperament, and hence common to the hysteric, dyspeptic, and choleric. Like the last variety, it is also occasionally found in repelled gout. There seems here, also, to be some depravation in the nature of the secretion, dependant on the debility of the secreting organs. And hence we sometimes find, that the morbid phlegm forms a nidus, as in various cases of phthisis, for the eggs of minute insects floating in the atmosphere, which are conveyed with the inspired air to the bronchial vessels, where they are hatched in the secreted fluid, and often thrown up in the shape of larvæ or maggots. In like manner, we sometimes meet with hydatids formed and thrown up in the same way; of which we have a singular example in the Medical Transactions, in a lady, thirty-seven years of age, of a delicate constitution, and nervous or hypochondriacal habit. For half a year, she expectorated more or less of these in the midst of thick viscid phlegm, sometimes to the amount of twelve, fifteen, or twenty-four in a day, of various sizes, from that of a pea to that of a pullet's egg.*

From the difference of causes and symptoms which these varieties evince, a very different mode of treatment is evidently required.

The first variety, produced by excess of action in the mucous membrane of the lungs, and mostly by sympathy with a remote organ, as in the case of cold and torpid feet, will be best relieved by diaphoretics and the warmer sedatives; and especially the compound powder of ipecacuanha, which will restore to the system its harmonious balance of power. The warm bath, or bathing the feet in warm water; warm and copious apozems, and oily or mucilaginous demulcents, are also peculiarly adapted to this species of cough. At the same time, the bowels should be kept open by any gentle laxative, as the neutral salts, or the confections of cassia or senna.

On the continent it has lately been a very popular practice to employ tartar-emetic in preference to ipecacuanha, whether alone or combined with opium, as in the compound powder. It has been given in all complaints of the chest attended with defluxion, and in all possible proportions: in some instances, so diluted with water as to form a part of the common beverage; and, in others, so concentrated as to rival our boldest wholesale prescribers of calomel. This is especially the practice of the supporters of the contra-stimulant Italian school. Thus Rasori has given a gradual increase of tartar-emetic, to the amount of two drachms a day; and, according to his account, without producing vomiting, except in the first instance. He adds, that when the patient gets better, the emetic property again comes into operation, and the remedy is left off. M. Peschier of Geneva has imitated this innovation. He declares bleeding to be useless, and that he cures all fluxions of the chest with tartar-emetic alone, which he

* Dr. Elliotson, in his Lectures at the London University, mentions a case which he met with, where a communication was formed between a cyst full of hydatids and the air-passages, so that the patient was in the habit of coughing up hydatids for some time before she died.—Ed.

gives in doses of fourteen grains in a day, without producing vomiting. And Dr. Duffin has lately informed us, that he swallowed from twenty to twenty-five grains of tartarized antimony by mistake, but without suffering from any remarkable symptom. From all which we may learn, I fear, that, in the present day, the powers of experiment are more widely afloat, than the powers of judgment and sobriety.*

In the disease before us, we have also reason to expect benefit from many of the expectorants, properly so called; those medicines, which rather promote the separation of the viscid phlegm with which the bronchiæ are loaded, than simply inviscate or dilute it, though these are also treated of as expectorants by many writers.†

The list of the proper expectorants employed formerly was very voluminous; in the present day, they are comparatively but few, and the proscription has, perhaps, been carried too far. The principle upon which they act is, in some degree, doubtful. The simplest way of accounting for it is, by means of a specific determination to the lungs. For, as we have pretty clear proofs of medicines operating specifically upon other organs, as that of mercury upon the salivary glands, and cinchona upon the irritable fibre, there is no reason why we should not expect a like operation upon the viscera of the chest. Dr. Cullen is quite at a loss upon this subject, from not admitting of specific medicines, or a specific action upon any organ. As a general rule, he supposes expectorants to operate on the bronchiæ merely by a diaphoretic power, or that of increasing the flow of the superficial exhalants at large, and consequently of the exhalants of the lungs, by which the mucus present in the follicles may be poured out in a less viscid form, and hence in a state to be more easily thrown up by the trachea.

But this is a very unsatisfactory view of the question. For, first, admitting that some medicines act directly upon the exhalants of the skin, a specific power is hereby immediately conceded to one set of organs; and if such power exist in respect to one set, there is no reason why it may not in respect to fifty. Next, we see evident proofs of an expectorant power in many medicines, as in gum-ammoniac, where we have no proof whatever of increased exhalation from the surface of the body. And further, the general explanation gives us no clew to the different operations of particular expectorants.

It is possible that in all these there is a peculiar stimulus; but whether this depends upon any sensible quality they possess, we cannot easily determine: for though many of them are more pungent to the taste than others, their degree of expectorant power does not in every instance keep pace with their degree of pungency.

In the variety, however, of a common mucous cough from cold, it is obvious that where expectorants are employed, they should be of a mild rather than of an acrimonious nature, as we have already an excess of action to encounter. And hence honey, the rob or jelly of the sub-acid fruits, as currants or raspberries, liquorice-root, and perhaps hyssop, butterbur, and inula, may be used with advantage, though the virtues of the last two or three are but doubtful, notwithstanding the high repute in which they were held formerly. The officinal inula of our own day, however, does not appear to be that of the Latins; for among them its farina is represented as having been particularly sapid; so much so, indeed, as to have formed a favourite ingredient in the most celebrated sauces of their public feasts. Horace speaks of it in one place (*Sat.*, lib. ii., viii., 51) as possessing a bitter taste; for he thus makes an epicure boast of having invented the sauce:—

"—INULAS ego primus AMARAS
Monstravi incoquere."

And in another (*Sat.*, lib. ii., ii., 44), he describes it as acrid, or stimulating; for it is probably in this sense that the ACIDAS should be understood:—

"—ACIDAS mavult inulas."

While Lucretius (*De Rer. Nat.*, ii., 430) makes it rather a mild general stimulant, or aromatic:—

"——quæ
TITILLARE magis sensus, quam lædere possint,
Fæcula jam quo de genere est, INULÆQUE sapores."

But let the quality of the Roman inula be what it may, we do not seem to possess the plant in the almost tasteless and inert root employed under this name in our own day.

In the second variety, or chronic cough of old age, where the mucous discharge is peculiarly viscid, much smaller in quantity, and excreted with great difficulty and laborious breathing, and the general symptoms evince great torpor of the extreme vessels of the lungs, the warmer and more pungent expectorants can alone be of any service, as the alliacea, and stimulant gum-resins, especially ammoniac, benzoin, styrax, and perhaps all the turpentine modifications.*

Tar-water was at one time a famous remedy; but has long fallen into great disesteem. From its warm terebinthinate impregnation, and the

* There is reason to think that the excessive use of tartar-emetic, as now adopted by some American practitioners, in not a few instances may prove detrimental. With Rasori and his disciples, fancy seems too frequently to have assumed the place of facts.—D.

† Expectorants are usually defined to be medicines which promote the excretion of mucus and fluids from the surface of the lungs and trachea. The reader will find an admirable chapter on the principles of their operation in Professor A. T. Thomson's Elem. of Materia Medica, vol. ii., p. 137.—ED.

* In the chronic cough of old age, moderate bloodletting will often be useful: depletion in this way, and by mild aperients, followed by the use of stimulating expectorants, as the syrup of squills, &c., is not to be overlooked. Dr. Rush has well sustained the importance of occasional bloodletting in several varieties of this complaint; and the experience of the best clinical observers accords in the utility of this practice.—See Dr. Scudder's Dissertation on the Diseases of Old Age, New-York, 8vo., 1813.—D

approach it makes to camphire and the gum-resins just enumerated, it may doubtless prove serviceable in many cases. It is for the same reason that the vapour of tar, exhaled from a tin pan with an oil or spirit-lamp beneath, as recommended by Sir Alexander Crichton in phthisis, is, in the present cough, frequently employed with advantage. The *acidum abietis*, another old preparation of the same kind, seems, however, to be the most deserving of trial of all the terebinthinate forms, and has sunk into disrepute without reason: it is the peculiar acid liquor, yielded along with the essential oil, in distillation of the fresh branches or fruit of the *pinus sylvestris* and *p. alba* of Linnæus. It is too acrid to be drunk alone, and is usually diluted with water: and combines in itself some portion of the terebinthinate-oil, with an acid very nearly resembling the acetous.

The same tribe of medicines will generally be found useful in the third variety, or that in which the cough is followed by a thin, frothy, and saline excretion; for here we meet with as much local atony and torpor of the excretories as in the preceding. We may here also with advantage employ several of the narcotic bitters, and especially the hop, in the form of pills or tincture; and occasionally the narcotics themselves, as opium, or hyoscyamus, or the extract of the common potato, *solanum tuberosum*, as recommended by Dr. Latham.—(*Med. Trans.*, vol. vi., art. 6.) But where the cough is dependant upon morbid affection of some remote organ, and the lungs are only influenced by sympathy, as is often the case in chronic hepatitis, it is obvious that our chief attention should be directed to the primary disease.

In the nervous or periodic cough, narcotics should be employed very cautiously, and only where the irritation is perpetual, or otherwise unconquerable; demulcents will also be of no service. Though the warmer expectorants may be useful, our chief dependance must be on general tonics, as the columbo, cusparia, and cinchona, with which may be combined several of the metallic oxydes, especially those of bismuth and zinc. When the flowers of zinc were in the height of their popularity, they were supposed to be an unfailing remedy; and Dr. Percival, of Manchester, has given numerous examples of their complete success. By having been too highly advocated, this medicine has now fallen into an undue degree of disesteem. Camphire and ammonia will often prove palliatives for the cough, and may be occasionally had resort to; but moderate exercise and change of air should uniformly make a part of the tonic plan, wherever the patient's means will allow.

In this modification of cough, more than in any other, we have reason also to expect benefit from a cautious employment of the prussic acid, which has the peculiar power of diminishing the general sensibility, without affecting the functions of respiration or circulation. Of all the cases published by Magendie and Brera, in proof of its beneficial qualities, none are so decisive as those of chronic and nervous coughs.* Six drops of the acid, prepared according to Scheele's method, may be given in a wineglass of infusion of cusparia every four hours.

* Recherches Physiologiques et Cliniques sur l'emploi de l'Acide Prussique ou Hydro-cyanique, dans le Traitement des Maladies de Poitrine, &c. Par F. Magendie, &c., 8vo., Paris, 1819. Under the name of *spasmodic cough*, Dr. Elliotson refers to a cough that comes on in long and violent paroxysms, and occurs in adult subjects: if united with inflammation, it is out of all proportion to it. In this disease, he has found the carbonate of iron the best remedy, sometimes preceded by bleeding, if the patient be robust.—(Lect. at London University.) The carbonate of iron might be tried in the chronic cough of elderly persons.—Ed.

SPECIES II.

BEX SICCA.

DRY COUGH.

COUGH UNACCOMPANIED WITH EXPECTORATION.

The symptom in the definition sufficiently shows that the seat of the disease is here, either in a remote organ or in the parenchyma, or general substance of the lungs, rather than in the mucous membrane of the bronchiæ. The disease is commonly, indeed, produced by some irritable substance generated within the lungs, as in the case of a scirrhous or calcareous affection of these organs; or conveyed into them from without, as is common to glasscutters, hewers of freestone or sandstone, workers of metals, and similar mechanics, in consequence of the finer particles of the materials on which they operate, being occasionally inhaled with the inspired air, and afterward making their way through the delicate tunics of the air-cells.

The dry cough is also at times to be traced to a remote irritation, as that of worms, or an inflammatory action in the intestines, liver, or other abdominal organs: in most cases, the lungs themselves are probably quite passive, and only yield to the propulsive action of the diaphragm, and its auxiliary muscles, to which the remote stimulus seems to confine its sympathetic power.

The minute and invisible eggs of various insects floating in the atmosphere, are also sometimes swallowed in like manner, and in a few instances hatched into larvæ, which have been thrown up by the coughing.—(*Bartholin. Act. Hafn.*, iv., obs. 46.) Minute pieces of bone, and the kernels of cherries and other fruits, have, moreover, occasionally slipped into the trachea accidentally; and, after exciting great irritation, and a hard dry cough for a considerable period of time, have ultimately been thrown up. A bean, in this manner, dropped into the trachea, was rejected on the fifth day in a violent fit of coughing.—(*Beaussier de la Bouchardiere, Journ. de Med.*, xlv., p. 267.) It is more extraordinary that materials, introduced into or engendered in wounds in the thorax, should at times be found to work their way into the bronchial vessels, and in like manner be thrown up by coughing. Yet in this way have been discharged surgical tents that have slipped beyond

the lips of the wound ;* and the splinter of a fractured rib.†

The varieties chiefly worthy of notice are the three following :

α Ingenerata. From ingenerate irritants.	From irritation produced locally, as a scrofulous, scirrhous, or calculous affection of the lungs.
β Extranea. From extraneous irritants.	From irritating materials inhaled from without, as in various operations on glass, metals, sandstone, and marble.‡
γ Verminosa. From remote worms or vermicules.	From some remote irritation, chiefly that of worms burrowing in the intestines, liver, or other abdominal organ.

Of these, the LAST is only to be removed by removing the primary disease. It is most common to children, and has the associate signs of a tumid belly, and pale emaciated countenance. For the medical treatment we must therefore refer to the genus HELMINTHIA, in the preceding class.

When the irritation proceeds from a SCROFULOUS OR CALCULOUS AFFECTION of the lungs themselves, our attention must be directed to the peculiar diathesis on which the disease is dependant. In the former case, small doses of the milder mercurial preparations, combined with the usual narcotics of the lurid and umbellate orders, as conium Œnanthe (dropwort), hyoscyamus, and solanum, may afford local relief by their narcotic and alterative power : while the general state of the system should be subjected to the regulations which will be found laid down under the diseases STRUMA and MARASMUS *Phthisis*, in the ensuing class.

The deposite of calcareous matter in the substance or air-cells of the lungs, may be the result of a morbid affection confined to the lungs themselves ; for we often find them loaded with a deposite of this kind, while all the other viscera are in a state of health ; or it may proceed from a calcareous diathesis, of which we shall have to treat more at large under the genus OSTHEXIA, in Class VI., Order I., of the Nosological Arrangement. In the former case, acid inhalations, or fumigating the chamber with the vapour of tar, which always contains a portion of acid, after the manner proposed under the preceding species, will afford a prospect, not merely of temporary relief by their tendency to dissolve the calcareous deposite, but probably of more permanent benefit, by changing the nature of the morbid action.

Where the formation of calcareous matter appears to depend upon an osthetic diathesis, or a constitution prone to generate lime, diluting apozems drunk freely will be serviceable ; and particularly a very free beverage of aerated mineral waters ; which, while they dilute, will tend to invigorate the system generally, and produce a beneficial change upon the habit. Where calculi are disposed to form in the kidneys or bladder, Dr. Russell has recommended a very liberal use of seawater ; De Haen of limewater, of which he tells us, that in one case, not less than 1500 pints were drunk with very essential advantage. Many foreign physicians advise the continental mineral springs, as those of Pyrmont, Carolina, and Barèges : while other pathologists have found large quantities of pure water, hot or cold, prove as good a palliative or remedy : in all which, we trace out one common principle, which is that of dilution, and we can trace out nothing else. A warm climate, which proves a perpetual diaphoretic, and urges perpetually to the surface, will also in all probability be found serviceable ; and, above all things, pure air, and as brisk exercise as the patient can bear without fatigue, so as to strengthen the system, and at the same time keep the skin soft and moist.

Mechanics engaged in working on metals, glass, freestone, or any other material, minute particles of which are apt to fly about and impregnate the atmosphere, and pass by inhalation into the lungs, should be peculiarly careful to keep their mouths and nostrils covered with a handkerchief. And if the lungs be irritated with sharp spiculæ, and a distressing and chronic cough be excited, all similar labour must be abstained from ; the diet be peculiarly light ; emetics be frequently administered ; and, in the interval, diluting apozems be used copiously, with bland demulcents. And if, by these means, we can check the irritation for some weeks or months, the lungs will often, by a growing habit of exposure to its cause, cease to be materially affected by it ; and the patient may pass through life without much inconvenience. But if hereby we should not be able to succeed, inflammation, hemorrhage, or phthisis, will probably be the result.*

In this variety, we have also great reason to expect benefit from the use of mild expectorants and demulcents.

Of the nature and operation of expectorants I have spoken already : and as there is no com-

* Tulpius, lib. ii., c. 15. Fabric. Hildanus, cent. i., obs. 46 ; cent. vi., obs. 22.

† Hildan. ex Pigray., ep. 51.

‡ Diemerbroeck, Anat., lib. iii., cap. 13. Rammazzini, &c. Morb. Artificum, cap. 26.

* Though various morbid affections of the lungs are imputed by Dr. Good, with many ancient and modern pathologists, to the inhalation of dust and other extraneous particles by several descriptions of workmen in their different employments, the correctness of the doctrine is denied by Professor Laennec (On Diseases of the Chest, &c. ed. 2, p. 137, transl. by Dr. Forbes), whose arguments, however, turn chiefly on the escape of some individuals from the mischief, though exposed to the suspected cause, and on the fact of dust taken into the lungs being expectorated afterward with the mucous secretion of the bronchiæ. Both these circumstances are true, and yet the temporary or partial lodgment of the extraneous matter may give rise in many instances to pulmonary disease. —Ed.

plaint in which demulcents can be employed to more advantage, and few in which they will prove so pleasant and tranquillizing, let us digress for one moment to examine into their nature and operation.

Demulcents are medicines that obtund the action of acrid or spicular materials, not by changing their acrimony, but by covering them with a viscid and inirritant fluid. They are of two sorts, mucilaginous and oily; and of the manner in which they act, when applied to the surface of the body, there is no doubt whatever. But, by what means they are able to retain their inviscating power, when passing through the stomach to a remote organ, is far less clear, and has been a source of considerable controversy. Where the irritation is in the lungs, as in the case before us, it has been supposed by many writers, and especially by Dr. Cullen, that by swallowing these substances leisurely, as we necessarily besmear the fauces and upper part of the glottis, we directly take off all irritation from these organs: and that the quietism hereby produced in the upper extremity of the trachea, is propagated by sympathy through the whole of the bronchial ramifications and the air-cells of the lungs; and that it is in this manner demulcents prove remedial in all pulmonic irritations.

But this is no explanation of their obtunding power in remote quarters, as for instance in the kidneys and bladder, where these organs have been stimulated by a blistering plaster: and as Dr. Cullen is not willing to allow of a specific power in medicines of any kind, nothing has remained to him but to cut the Gordian knot abruptly, and to contend that "the operation of demulcents in covering acrimony in the mass of blood, must be very inconsiderable."—(*Mat. Med.*, part ii., cap. xii., p. 412.)

But this is to uphold an hypothesis by an assertion, opposed to the experienced train of events, and to which he himself submits on other occasions; for Dr. Cullen has no hesitation in recommending the use of demulcents, when we follow him into his practice, almost as freely as any other physician whatever. I pretend not to determine whether they act in every instance when employed internally by their sensible quality of viscosity, or by some insensible specific power; but that, by some means or other, they are capable of allaying irritation in organs remote from the stomach, is a fact so generally known, that it would be a waste of words to bring examples of it. And notwithstanding the difficulty of conceiving how a few drachms of bland oil, or a few ounces of gumarabic, can be intermixed with many pounds of serosity, and still retain their sensible quality of inviscating sedatives, it is by no means more difficult to conceive this, than that moderate doses of sulphuric acid, introduced into the stomach, should pass copiously by the skin in its acid state, as Dr. Cullen allows it to do, and cure the itch; or that the muriate of soda, employed as an ingredient in the manufacture of glass, should, in the melting of this material, impregnate the atmosphere of the glasshouse, be inhaled by the lungs of the workmen, and passing with the matter of perspiration through the pores of the skin, once more concrete in crystals on their foreheads.

As several of the vegetable oils are obtained from narcotic plants, it is well worth inquiring, though a different question, whether, in any of these, there is a combination of any portion of the narcotic principle; as such oils would in many cases possess a high advantage over the rest. The oils of this description which have been most tried, are those obtained from the seeds of the *lactuca virosa*, and the *papaver somniferum:* and both these kinds of seeds, while they make pleasant emulsions, are said by many writers to communicate a slight degree of narcotic power at the same time; an assertion, however, which Dr. Cullen does not give credit to, and which seems to be disproved by repeated trains of experiments in France, and especially by those of the society of agriculture in 1773, with respect to the former. But as I have not tried them sufficiently to speak with decision on the subject, I merely throw out the hint, that it may be followed up by others, and extended to plants not yet examined for this purpose. The seeds of both plants give forth oil pretty freely; those of the poppy often in the proportion of six or seven ounces of the oil to every two pounds of the seeds.

In hot weather, sultry climates, or long voyages, where rancidity may be apprehended, the best, as well as the pleasantest of all the vegetable oils, is the expressed oil of the cocoanut, commonly known by the name of BUTTER OF CHOCOLATE. It is of a brownish hue when first obtained, but may be whitened by ablution in hot water, and still more so by an alkaline ley, quicklime, or spirit of wine. It will keep for years without becoming rancid, and may even be left for a month in a copper vessel without undergoing this change.

Of the vegetable mucilages, the best fitted for keeping is that obtained from the Iceland moss. If infused in water before it is boiled, it will lose much of its rough bitterness and colouring material, and its taste will be pleasant. Its viscidity is more than double that of gumarabic; and emulsions, thus formed, have been kept fourteen weeks without the slightest marks of putrescence.

SPECIES III.

BEX CONVULSIVA.

HOOPING-COUGH. KIN-COUGH.

THE COUGH CONVULSIVE AND SUFFOCATIVE; ACCOMPANIED WITH A SHRILL REITERATED HOOP; AND FREQUENTLY WITH VOMITING; CONTAGIOUS.

THE Greeks denominated this disease BEX *theriodes* (θηριώδης), which the Latins translated literally TUSSIS *ferina*, "wild or untameable cough," from its violence. The name of Pertussis, by which it has often been called in later times, is of doubtful origin and meaning; and I have hence followed M. de Sauvages and exchanged it for TUSSIS *convulsiva*, the specific epithet being far more expressive than that of

tne Greek writers. Our own name of Hooping-cough is evidently derived from the convulsive clangour which accompanies the fit. The name of *Kin-cough*, by which it is distinguished in the north, and which should rather be written *Kind-cough*, is derived from the Saxon or German term *Kind*, "a child," as being peculiarly common to this age. This cough is contagious, though not in a very high degree; whence Stoll and other writers have fallen into the error of asserting, that it is not so at all.* [Even Laennec (Op. cit., p. 96) deems the contagious nature of hooping-cough not satisfactorily proved, and regards alternation of temperature quite as much a cause of this as of other catarrhs.]

The remote cause of hooping-cough is often difficult to trace. Frequently, indeed, like common or humid cough, it seems to proceed from cold, from some irritability of the stomach (*Allgem. Deutsche Bibl.*, lvii., p. 434), or some peculiar affection of the lungs.—(*Stoll, Prælect.*, p. 289.) I have already observed, that the dry cough (tussis *sicca*) has occasionally been produced by larvæ of insects, whose minute eggs, being inhaled with the air of respiration, have found a convenient nidus in the bronchial vessels; and hence Linnæus, who at one period of his life endeavoured to resolve almost all diseases whatever into an animalcular or insect origin, taught that the hooping-cough was also produced in the same way by an insect of a peculiar kind.—(*Amœn. Acad.*, vol. v., p. 82.) This opinion has not been adopted beyond the precincts of the Linnéan school. But we are, nevertheless, very considerably in the dark upon the subject; for there are numerous cases of the disease occurring daily in which it originates from a source that eludes our research altogether. It is most common to children, though sometimes to be met with in adults; is often epidemic; but rarely, if ever, attacks more than once in a man's life. And from all these circumstances, it may be inferred that it proceeds, in most instances, from a miasm of a specific nature and peculiar quality; which, like those of the influenza or epidemic catarrh, and the measles, has a direct determination to the lungs; though it is not, like these contagions, essentially linked with fever.

The excretion is at first small in quantity, but afterward more copious, though always viscid. The hoop, or sonorous spasm, is often accompanied with a rejection of the contents of the stomach;† and the whole system, during the paroxysm, suffers great violence. The face is turgid and purple from suffusion, and the eyeballs swollen and prominent. The little patient, with a forewarning of the attack, falls on his knees at the time, or clings closely to any thing near him. Yet the violence is instantly forgotten; and, after deeply panting for breath, he returns with as much eagerness as ever to his play, or other pursuit: while the vomiting, which is commonly a good sign, is succeeded by a craving for fresh food. [In the words of Laennec, a colourless, and scarcely frothy, but ropy phlegm, rather flows than is rejected from the mouth, after each paroxysm, while the patient leans forward to favour its escape. The paroxysms at first recur several times every day, being almost always most severe towards the evening, but less violent in the night. After a certain time, they return only in the morning and evening, and towards the end of the disease, in the evening only. Before it terminates the paroxysms are shorter, lose their peculiar characters, and are attended with an expectoration more decidedly mucous. Sometimes the disease degenerates into a chronic mucous catarrh, with emaciation, and other symptoms resembling those of consumption. In the interval of the paroxysms, the patient coughs but little, and though Drs. Cullen and Watt represent some slight febrile indisposition as being mostly observable at certain periods of the day, Laennec states, that the patient rarely has any fever, except in the case just now mentioned, or at the beginning of a very severe attack.*]

* Rat. Med., part ii., p. 184. It is not an unsommon belief, and it was adopted by Cullen, that hooping-cough is not contagious beyond a month or six weeks from its commencement, just as is the case with some other contagious diseases, as for instance gonorrhœa, though, as Dr. Elliotson well observes, nobody will venture to fix the period of the commencement of its innoxious character.—Lect., Med. Gaz., 1832-33, p. 194.

† When the child vomits, it is generally considered a good sign: if there be no vomiting, the case is often found to be very severe. Dr. Gregory knew a lady who never hooped in the disease, but, instead of doing so, always fainted. The disease prevailed in the family, and she had as violent a cough as the rest.—Elliotson's Lectures, Med. Gaz. for 1832-3, p. 194.

* See Laennec on Diseases of the Chest, &c., transl. by Forbes, p. 96, ed. 2, 8vo., Lond., 1827. As bronchitis is not an infrequent complication of hooping-cough, especially of the most dangerous forms of it, febrile symptoms must occasionally attend the disorder. Dr. C. Johnson distinguishes four states of hooping-cough: 1. Simple hooping-cough. 2. Hooping-cough complicated with bronchitis, or peripneumony. 3. Complicated with disordered bowels, or infantile remittent fever. 4. With convulsions, or hydrocephalus. The latter ought, perhaps, to have made two varieties. We see then that the disease is liable to be combined with infantile remittent fever, as well as the common sympathetic fever of inflammation. A great number of the long-protracted cases are complicated with remittent fever, which sometimes begins with a rigour, but more frequently comes on so gradually, that the date of its commencement cannot be fixed. "The paroxysms of coughing become more frequent, and the breathing is quickened and oppressed; but still it may be, with a little care, distinguished from the attack of bronchial inflammation. The stethoscope affords us useful though negative evidence. The usual symptoms of bronchial inflammation are absent. The frequency and force of the respiration are increased; but this increase is not accompanied by any râle, indicative of bronchial inflammation; while the daily remissions, the loaded tongue, the nature of the alvine discharges, the aspect of the child, constantly picking his nose and lips, all serve to determine the true character of the disease."—Cyclop. of Pract. Med., art. HOOPING-COUGH, by Dr. C. Johnson.—ED.

The disease lasts irregularly from three weeks to as many months.

[Each fit is composed of a quick succession of sonorous coughs, with scarcely any perceptible intervening inspirations, except that, from time to time, the expirations of coughing are suddenly interrupted by a very deep, seemingly convulsive, and noisy inspiration, accompanied by a lengthened hissing, that constitutes the pathognomonic sign of the disease. Laennec represents the peculiar sonorous inspiration as seated exclusively in the larynx and trachea. He also considers the spasmodic character of the hooping-cough as sufficiently proved by certain phenomena, which occasionally show themselves in the glottis, larynx, and even in the pendulous veil of the palate. The extraordinary noises made by certain patients in breathing, or coughing, he imputes to a spasmodic or voluntary contraction of these parts. The same, he says, is true of the peculiar sounds which attend the hooping-cough. He has seen patients who crowed like a cock, or barked like a dog. Dr. Bally sent him a patient with hooping-cough, in whom the paroxysms were accompanied with a cooing, like that of a woodpigeon. Laennec was convinced by observation, and the aid of the stethoscope, that the sound arose from a spasmodic contraction of the veil of the palate and sides of the glottis. The opinion was further confirmed, by the suspension of the sound by an accidental inflammation of the throat, and its renewal, in a less degree, on the subsidence of the latter complaint.—(Op. cit., ed. 2, p. 96–98.)]

The hooping-cough, when in the height of its career, is usually accompanied with very copious secretion of mucus, a free discharge of which mitigates the general symptoms. From this circumstance Dr. Butter concludes, that a morbid irritability of the mucous glands is the primary affection, to which the spasms are only secondary.—(*Treatise on the Kin-cough*, with an Appendix, &c., 8vo.) It is somewhat singular, that, with this view of the disease, he should place its seat, not in the larynx, or any part of the trachea, but in the alimentary canal. In infants, it is mostly alarming from its tendency to produce convulsions, suffocation, apoplexy, inflammation of the brain, ruptures, and incurvation of the spine. [The younger the subject, the more dangerous the disorder generally; and the large majority of those who die from its attacks, are observed to be under two years of age. Children born of phthisical, asthmatic parents, are most likely to suffer from the violence of the disease. Yet it is said that a healthy child under six months, who has a good nurse, will get through the disease better than one a few months older, who has been recently weaned, or in whom dentition has commenced. The following circumstances are also enumerated by Dr. C. Johnson, as justifying a favourable prognosis: dentition being completed, and the head, bowels, and lungs not being subject to determinations or irritations; the season of the year being mild and dry; the patient not suffering, or not having recently suffered from any of the other diseases of childhood, and having a sound healthy constitution; finally, the accessions being at long intervals, the remissions complete, and the night, during which the symptoms are usually most severe, well spent. In adults, the prognosis is more favourable than in infants.] In adults, it excites pneumonitis more frequently than in children; and, in pregnant women, has often led to abortion. A moist skin, warm extremities, open bowels, plentiful expectoration, and free vomiting, are favourable symptoms. Frequent hemorrhage protracts the disease; and if it proceed from the lungs, a foundation will often be laid for phthisis. The violence of the action occasionally excites inflammation in the trachea. Dr. Marcus, among other singular opinions that distinguished his career, brought himself at last to believe, that such inflammation was always present: and having advanced thus far, he next undertook to show that hooping-cough and croup are one and the same disease. He died, indeed, while dictating the preface to his treatise on the former affection, which he hoped would establish this opinion. Dr. Dawson has since revived a part of this hypothesis, by conceiving that hooping-cough is a specific inflammation, seated in the glottis, or upper part of the trachea, and spreading more or less widely, according to the degree of its violence: but he does not identify it with croup. —(*Nosological Practice of Physic*, 8vo., 1824.)

[Dr. Watt inculcated the opinion, that hooping-cough is essentially an inflammation of the mucous membrane of the bronchiæ, which statement agrees with Laennec's description; and, if correct, the complaint should properly be regarded, with Laennec, as a species of catarrh, and classed accordingly. The disease, when fatal, generally becomes so from severe bronchitis. In several instances, in which the state of the lungs was ascertained by dissection after death, the most remarkable appearances were an inflamed condition of the trachea and bronchiæ, particularly of the latter, and an almost complete obstruction of the bronchial passages with a serous or mucous fluid, interspersed with flakes of semipurulent matter.—(*Treatise on Chin-cough*, &c., p. 123, 8vo., 1813.) These effects may be supposed to be only the consequence of the violent cough; but as Dr. Forbes has remarked, the opinion, delivered on the seat of the complaint by Dr. Watt, is amply confirmed by the early symptoms, and the indications of the stethoscope.*]

* Note in transl. of Laennec on Diseases of the Chest, &c., p. 98, ed. 2. In the greater number of cases where children die, says Dr. Elliotson, there is a violent bronchitis, sometimes combined with an extensive inflammation of the substance of the lungs. But he adds, that, on opening children who have died of this disease, you sometimes find very little the matter with the lungs, and death may have arisen from some other cause; for the disease has a great tendency to produce hydrocephalus and convulsions. When the air-cells inflame, and the lungs become more or less hepatized, the silvery rattle may be heard with the stethoscope, and the breathing is excessively loud and rough throughout the chest.—(Lect. at Lond Univ.—See Med. Gaz. for 1832-3, p. 194.) The

In a few rare instances, hooping-cough assumes a periodic character, and is then sure to become peculiarly intractable. Dr. Perceval, in his Comments on the Nosology, has favoured me with a singular case of this kind, which occurred daily at a certain hour, attended with a tremor of the whole body: the fit terminating by a shriek, rather than a hoop. The complaint was obstinate for several months, and returned at the same season for two years. It yielded to no medicine, and was supposed to depend on some morbid condition of the liver.

[Notwithstanding the contrary statements sometimes made, Dr. C. Johnson believes that the hooping-cough rarely, if ever, affects the same individual twice; and that it is seldom met with in adults, of which, however, instances are upon record.]

Dr. Cullen, in laying down his own mode of treatment, indulges in an ingenious, and I believe correct hypothesis, and divides the disease into two stages. The first consists of that part of it during which he supposes the contagion to be present and operative, which possibly may include the first three weeks; the second embraces the remainder of its duration. Throughout the former stage, our attention should be directed to whatever will moderate the influence of the contagious stimulus, retard the return of the convulsive paroxysms, and mitigate their violence. [If the patient can be made to drink by small and repeated portions during the paroxysm, its severity and duration, according to Laennec (Op. cit., p. 98), will be diminished; perhaps from the effort of deglutition facilitating deeper inspirations, by counteracting the spasms of the bronchiæ.] Bleeding, in severe cases, will usually be found necessary for this purpose; but it should be avoided under other circumstances; and it will generally be found better to employ blisters as a substitute. The most effectual remedy is emetics; whose action tends equally to interrupt the return of the paroxysms, and to keep the lungs unloaded, by producing a determination towards the surface. [Laennec recommends them to be repeated every day, or every second day, for a week or a fortnight; and prefers tartarized antimony to ipecacuanha, on account of the great inequality of power in the latter, and the solubility of the former allowing it to be more easily administered in doses proportioned to the exigency of the case.] The food must be light, and costiveness carefully prevented; but no benefit seems to be derived from purging.*

In this manner, upon Dr. Cullen's mode of treatment, we are to guide the patient through that part of the disease which we may suppose to be kept up by the stimulus of contagion. In its latter part, or second stage, in which a morbid habit alone is, in all probability, the irritative power, a different course is demanded. For we have now nothing more to do, than to oppose the spasmodic habit by an antispasmodic process; and hence different tribes of medicines have been resorted to, which may be arranged under the three divisions—of SEDATIVES, for the purpose of taking off the morbid irritability of the affected muscles; STIMULANTS, for the purpose of local or general revulsion; and TONICS, for that of both local and general reinvigoration.

The sedatives chiefly recommended, have been opium, hyoscyamus, belladonna, conium, musk, and the hydrocyanic acid.

Though opium has the authority of many distinguished practitioners (*Hufeland, N. Annalen*, i., p. 367; *Demachy, Manuel de Pharmacie, Paris*, 1788; *Rüling, Beobachtung der Stat. Northeim.*, p. 107), it has often been found of no avail, even where it has been given in large and frequent doses; and, still more generally, it has been productive of greater mischief than good. The compound powder of ipecacuanha is one of the best preparations of opium which can be employed in this disorder. The conium has acquired a far higher degree of public favour, for which it is much indebted to the writings of Dr. Butter, who represents it as having the double virtue of retarding the returns of the convulsive paroxysms, and of mitigating their violence; and on this account, he prescribed it through every stage of the disease, and however complicated with other affections. He employed it, moreover, in every form, whether of powder, extract, plaster, or cataplasm; but, for internal use, he gave the powder, allotting a grain a day to infants under six months, and ten grains to adults, with a gradual increase as they persevered. [After emetics, Laennec also prescribes narcotics in small doses, and considers the extract and powder of belladonna as the best medicine of this class. The dose is from ½ to ¼ of a grain. Its efficacy in lessening the severity of the cough, and shortening the duration of the disease, he conceives, may be accounted for by its lessening the necessity of respiration, and consequently the dyspnœa; obviating the spasm of the bronchiæ; diminishing the irritation produced by the vascular congestion of the mucous membrane; and lessening the augmented secretion.]

danger is in proportion to the affection of the head, the bronchitis, and the peripneumonia.—Ed.

* A better founded division of hooping-cough is into the inflammatory and merely spasmodic forms. If there should be a constant oppression of the breathing, with spasmodic attacks, and a violent cough at times, an accelerated pulse, and a sonorous, sibulous, and crepitous rattle, there is inflammation of the bronchiæ, or the substance of the lungs. Here, as Dr. Elliotson properly remarks, you might give all the antispasmodics, all the narcotics, and all the medicines that are supposed to have a direct influence over spasm, and yet do no good. If the patient be old enough, he must be bled occasionally in the arm; leeches should be applied to the chest, and mercury and emetics exhibited. "In the greater number of cases, the inflammation is such as will yield to the application of a few leeches and the exhibition of emetics; but it is of great use likewise to clear out the bowels by calomel, provided the inflammation is severe, and to give it steadily in small and repeated doses." —(Med. Gaz., loc. cit.) Dr. Elliotson is also an advocate for the warm bath, and for not letting children with this disease overload the stomach, or move or run about a great deal; circumstances always aggravating the cough, and the bronchitis, if any degree of it be present.—Ed.

Musk has been tried both abroad and at home, from six grains to half a drachm at a time; but its effects are so various, and, indeed, contradictory in different individuals, as to prevent confidence in its use.

The prussic or hydrocyanic acid has unquestionably subdued the spasmodic irritation, and consequently relieved the cough, in a variety of instances. It is here, indeed, and in nervous cough, that it seems to act with most advantage.—(*Recherches Physiol. et Clin. sur l'Emploi de l'Ac. Prussique*, &c., *par N. Magendie, D. M., Paris*, 1819.) I have known it succeed when there was the utmost degree of danger from general convulsions; the dose for a child of four years old being from a drop to a drop and a half, or even two drops of Scheele's preparation of the acid, every four hours, till a decided impression is produced.*

The stimulant plan, if it have not been more successful than the sedative, has at least been as powerfully supported. Its intention I have already stated to be that of taking off the propensity to spasmodic action in the trachea, by exciting a general or remote local revulsion. And the medicines chiefly employed for this purpose, have been cantharides, ammonia, ether, camphire, the herb Paris, and rhus Vernix.

[Laennec has seldom found blisters of much use: instead of them, Autenrieth has proposed the application of tartar emetic ointment to the chest, a plan, from which more benefit has sometimes resulted than from blisters.]

When blisters were formerly employed with great freedom in the hooping-cough, it was thought to be ascertained, that they always answered best when they irritated the bladder and occasioned strangury. And, on this account, some practitioners have endeavoured to produce the latter effect without the pain of the former, and have for this purpose employed cantharides in tincture, in the proportion of twenty minims to a dose.—(*Forbes*, loc. cit.) Dr. Barton of York first joined it with bark and the compound tincture of camphire, a practice afterward adopted by Dr. Lettsom, Hufeland, and others. But whether given alone or in combination, I have never found any decided benefit from its use.

Where the intention is to divert the tendency to convulsive action by local revellents, it is far better to employ them externally, and particularly on the chest, and down the chain of the spine. The most common stimulants for this purpose are camphire, ammonia, ether, and the essential oils of amber and turpentine, which, in different combinations, have been long used, and still preserve their reputation.

I have reason to believe that embrocations of this kind have often proved highly beneficial: and it is not difficult to account for such an effect: since the cervical and dorsal nerves are so generally distributed over the muscles of the chest, the diaphragm, and the scapulæ; and some of them, as the accessory nerves of Willis, form an integral part of the par vagum, and assist in giving rise to the cardiac and pulmonic plexus.*

Many stimulants have also been occasionally employed internally for the purpose of producing an excitement generally, and thus of acting as universal revellents; as camphire, ammonia, and the sulphuric and nitric ethers. These have often been found useful, and, where narcotics are given, they rather assist than oppose their good effect.

[Dr. Andrews (*Glasgow Med. Journ.*, vol. i., p. 178) prescribed the tincture of lobelia inflata† with striking success. He says that there is no other medicine that so effectually frees the bronchial vessels of their viscid secretion. It is emetic and antispasmodic. The dose generally given by him was thirty or forty minims, every twenty minutes.]

The *rhus vernix* comes also strongly recommended by many foreign writers of distinguished character, as a stimulant and antispasmodic of considerable power, and highly useful in the hooping-cough. Dr. Fresnoi, to whom we are chiefly indebted for our acquaintance with it, employed its leaves in the form of an extract. Of this he dissolved four grains in four ounces of sirup, and gave a table-spoonful every three hours to a child.

[By Dr. Millar, a high opinion was entertained of asafœtida, as a remedy for hooping-cough, as well as asthma.]

After all, if no bronchitis exists, perhaps the best antispasmodics are tonic medicines, and a tonic regimen. Dr. Cullen trusts almost exclusively to the cinchona: "I consider," says he, "the use of this medicine as the most certain means of curing the disease in its second stage; and when there has been little fever present, and a sufficient quantity of the bark has been given, it has seldom failed of soon putting an end to the disease."

The best and most convenient form of the bark for children is the sulphate of quinine. [It is observed by Laennec, that, when the paroxysms of hooping-cough assume a periodical type, cinchona, and the sulphate of quinine, are as efficacious as in cases of ague.] When the sulphate of quinine disagrees, as it will sometimes do, I have employed the mineral tonics, as the oxyde of zinc, from half a grain to a grain, two or three times a day; or the nitrate of silver, from the twelfth to the eighth part of a grain, repeated in the same manner.

[Dr. Elliotson considers the preparations of iron as the best tonics which can be employed

* If the child be young, Dr. Elliotson recommends one minim to be put in an ounce or two of almond emulsion, one teaspoonful of which, he says, will be the proper dose, three or four times a day.—Ed.

* The inhalation of tar fumes, sometimes recommended, is only allowable when no inflammation is present.—See Elliotson, Med. Gaz., 1832-3, p. 196.—Ed.

† This medicine is highly recommended by Dr Thatcher also. See Am. Modern Practice of Physic, Boston, 8vo., p. 248. See also Barton's Veg. Mat. Med. of the U. States, vol. i., p. 127.—D

in cases of hooping-cough, where no occasion for antiphlogistic treatment exists. The sulphate can be conveniently given to children in mixtures, or the carbonate blended with treacle.]

As an important part of our tonic plan, may be mentioned change of air, and especially where the difference of temperament, or even temperature, can be rendered very considerable, as from a low to a high atmosphere, or from the interior of a country to the seacoast; but cold-bathing, so far as my own experience extends, has proved more certainly and rapidly remedial, than any other prescription whatever; and particularly where it has never been made use of before, and hence introduces a new action into the system.*

[The extract of common daffodil (narcissus pseudo-narcissus), and the infusion of its petals, were proposed, a few years ago, as a specific against this disease. Laennec, who tried the extract, found it, however, much less efficacious than belladonna. The dose is half a grain, a grain, or two grains, every two, four, or six hours, according to the patient's strength. Its mode of action is imperfectly known.*]

GENUS II.

LARYNGISMUS.

LARYNGIC SUFFOCATION.

SENSE OF SPASMODIC SUFFOCATION IN THE LARYNX, COMMENCING SUDDENLY, AND RELAXING, OR INTERMITTING; COUGH TROUBLESOME; SCANTY DISCHARGE OF VISCID MUCUS.

There is a disease that often attacks the larynx, and especially of infants and children, which has so near a resemblance to croup, as to be very generally confounded with it, and which is hence commonly known by the name of *spasmodic croup:* but which, notwithstanding the resemblance of many of its symptoms, is essentially different from it, and ought to be arranged in a different place. It is for this purpose the present genus has been formed, and the present name invented, with a termination that sufficiently distinguishes it from laryngitis, or *inflammation* of the larynx, yet a termination that has the sanction of the best medical writers in every age.—(See *Prelim. Diss. to the Author's System of Nosology.*) The distinctive characters of bronchlemmitis, or

* The diversity of views presented in the text concerning the nature and treatment of hooping-cough, seems to demand a word from the American editor. It is a truth painfully familiar to every observer, that, in our country, death by hooping-cough is not uncommon. The disease may fairly be considered as arising from a specific cause: of a contagious character, and as affecting adults of an advanced age as well as infants a few months old. "I have seen the disorder," says Dr. Francis, "sometimes occurring in children of some six or eight months of age, and but recently it proved fatal to an adult in his 82d year; nor does the system always enjoy an immunity from a second attack." From the circumstances which accompany it, it may be deemed occasionally of a spasmodic character, without inflammation; but in most cases, it must be classed strictly among the phlogotica: it involves the glottis, and the mucous lining of the bronchiæ is primarily affected with inflammation. The characteristics of spasm which so generally marks it, is doubtless attendant upon the peculiar seat of the inflammation; and this principle is illustrated also by the phenomena which croup often exhibits. A practical writer of eminence, Dr. Eberle, in speaking of the pathology of hooping-cough, remarks, "It appears to me that hooping-cough is essentially a spasmodic or nervous affection, the proximate cause of which consists principally in a peculiar irritation of the eighth pair, or the pneumogastric nerves."—(Practice of Medicine, vol. ii., p. 229.) This opinion has been advanced by several German writers; post-mortem examinations, however, of bodies dead by hooping-cough, often present various and opposite conditions, and some doubtless which have no connexion with the disease. A late writer, Desruelles, maintains that it is a bronchitis, which in its progress becomes complicated with cerebral irritation and congestion; that this encephalic irritation assumes an intermittent form, and is the primary organic cause of the convulsive cough which characterizes the disease. He therefore proposes to designate the disorder by the term, broncho-cephalitis.—(North Am. Med. and Surg. Journal, vol. ii., p. 156.) Inasmuch as there is a predominant tendency in this complaint to congestion of the brain and hydrocephalus, this name is not without its practical advantages. If hooping-cough be neglected, or badly treated, without reference to its acute character, it terminates so frequently in hydrocephalus, that the physician cannot be too mindful of this serious result. "Hooping-cough," says another distinguished American writer, "like catarrh, divides itself into two stages: the first febrile or inflammatory, to be treated by bloodletting, emetics, small doses of antimony, abstinence, and the usual means constituting the antiphlogistic treatment. The second or passive stage, like the chronic state of catarrh, is frequently of long duration, and continued by the sensibility of the lungs attendant upon weakness. Exercise, change of air, stimuli, in the form of food and medicine, the external application of various embrocations, with the occasional use of vitriolic emetics, Mosely's solution, or the fashionable antipertussis, are now indicated. I have also oftentimes given the combination of the tincture of bark and cantharides, as recommended by Dr. Lettsom, with the best effects."—*Hosack's Essays*, vol. ii., p. 459. After suitable depletory means have been adopted, corresponding to the activity of the disease, emetics are among our most valuable remedies. Ipecacuanha is often efficient, and is generally a safe article: in this state of the disorder, however, Dr. Francis advocates a free use of the vitriolic emetics, particularly of the sulphate of zinc; "they have the advantage," he says, "of not adding to the debility of the sufferer, and relieve promptly and efficiently by ejecting the overloaded excretion of the bronchial vessels, and by harmonizing the disturbed and oppressed respiration." Our remedies may control the violence of hooping-cough, and safely modify its course; but except in cases purely spasmodic, can have but little influence in cutting short its duration.—D.

* When hooping-cough is complicated with infantile remittent fever, depending on constipation, or on derangement of the abdominal secretions, purgatives and alteratives are called for; especially, in the former case, calomel, rhubarb, and scammony; and in the latter, rhubarb and carbonate of soda, or the hydrarg. cum creta, or Dover's powder, followed by castor-oil.—Ed.

croup, are, inflammation of the mucous membrane of the trachea and bronchial vessels, and the secretion of a peculiar concrete and membrane-like material that lines the tracheal tubes, and threatens suffocation by obstructing them. In the disease before us, we have neither inflammation nor membrane-like secretion; while the sense of suffocation is produced, not by obstruction, but by spasm. The only known species belonging to this genus is the following.

SPECIES.

LARYNGISMUS STRIDULUS.

STRIDULOUS CONSTRICTION OF THE LARYNX.

COMMENCING USUALLY IN THE NIGHT; VOICE SHRILL AND CROAKING; COUNTENANCE FLUSHED AND SWOLLEN; DISTRESSING STRUGGLE FOR BREATH.

This species forms the spasmodic asthma of Millar, Parr, and various other writers. Yet it is not strictly an asthma, though it makes an approach to it; and the name under which it has been thus described, shows sufficiently that the present is the proper place for its reception. In asthma, the constriction begins in the chest, and chiefly exerts itself there, though the spasm may extend to the upper part of the trachea. In spasmodic laryngismus the constriction commences in the larynx, and is chiefly confined to that organ, though it may extend to the chest. In the former, the respiration is wheezy, but the voice is not stridulous; in the latter, the voice is stridulous, but the respiration is rarely wheezy, or seldom so in an equal degree; evidently showing a difference in the seat of the two diseases. And hence I have found it necessary to separate it from asthma, and arrange it under a different head.

As already observed, the general symptoms make a nearer approach to croup. "The inconvenience," observes Dr. Parr, "is the greater, since, from the resemblance of the symptoms, remedies have been celebrated as successful in croup which were never used in the disease; and the less experienced practitioner, trusting to them, has felt the severest disappointment."

The suddenness with which this complaint commences its attack, forms another mark of distinction between itself and croup, almost as pathognomonic as the absence of inflammation, and the peculiar secretion in the latter. There are instances, indeed, in which genuine croup has also commenced abruptly, but these are very rare; for it has usually the precursive symptoms of a slight cough and hoarseness for a day, and sometimes two days, as though the patient were labouring under a catarrh. In croup, also, the inflammation, when it has once taken effect, becomes a permanent cause of excitement, and the anxiety and struggle for breath continue, with little if any abatement, till the inflammation is subdued. In the disease before us, the spasm suddenly subsides in a short time, though it may perhaps return in an hour, or half an hour, or even a few minutes; and, in the interval, the patient enjoys perfect ease, though the voice is rendered hoarse from the previous straining. Croup is, moreover, an exclusive disease of children; stridulous spasm of the larynx is sometimes found in adults. Those who have been dissatisfied with the name of spasmodic asthma, have, however, treated of it under the name of spasmodic croup, but merely because they have not known how else to distinguish it; for almost every one who has thus noticed it, has acknowledged that it is a different disease, and demands a different plan of cure.

The exciting causes are not always clear. cold and teething are the most common. It appears most frequently in relaxed and irritable habits, where, in truth, we should soonest expect a display of spasmodic action. As there is mostly some degree of cough, and always a secretion of a small portion of viscid mucus, and a croaking voice, there is indeed great reason for supposing some degree of local irritation; and it is on this account that I have preferred entering the disease here, to an arrangement of it under the fourth class, consisting of diseases that are purely and idiopathically nervous. It is possible, however, that some of these symptoms may be the result of the spasmodic struggle itself.

An active plan of treatment is imperiously demanded. Yet an antimonial emetic generally effects a cure as soon as it begins to operate, if employed early: but the diaphoresis which it excites should be maintained for some hours, by keeping the child in bed, and the use of diluents; which will be the most effectual means of preventing a return of the spasm. The bowels should also be excited by a purgative of calomel. And if the emetic do not prove sufficient, or the stricture should be renewed, laudanum should be exhibited according to the age of the patient, and a blister be applied to the throat. But bleeding, which is indispensable in croup, should here be avoided, as it will only add to the irritability. Those who regard this affection as an asthma, have strongly recommended the fetid antispasmodics, as asafœtida, both by the mouth and injections; but I have not found them successful.

Generally speaking, after the action of the emetic, the child falls into a deep and quiet sleep, and awakes with few remains of the complaint. Yet, if the spasm be not attacked at once, suffocation may soon follow. Those who have once laboured under it, are more susceptible of it than before; and the younger branches of some families seem much more predisposed to it than those of others.

This disease has been noticed by M. Bretonneau of Tours, and described under the name of *angina stridula*. It was mistaken occasionally for a peculiar form of *angina maligna*, which was then prevailing as a contagious disease, and in which the local inflammation, instead of producing ulcerations, threw off membranous or croupy exfoliations, and was accom-

panied with a croupy suffocation. But, in the case before us, there was no swelling of the lymphatic glands at the angle of the jaws; the tonsils and velum palati were free from redness or tumefaction, and no pain was complained of in the region of the larynx. While the attendants were about to apply leeches, and exhibit an emetic, the little patient fell into a refreshing sleep; a gentle moisture appeared on the skin, the cough became looser and little troublesome; and next morning the complaint was nothing more than a common cold, which required no further medical aid. M. Bretonneau regards this affection as only a simple œdematous tumefaction (une simple tuméfaction œdemateuse) of the mucous folds in the ventricles of the larynx.—(*Des Infl. spéciales du Tissu Muq.*, &c. Par P. Bretonneau, Paris, 1826.)

GENUS III.

DYSPNŒA.*

ANHELATION

PERMANENT DIFFICULTY OF BREATHING; WITH A SENSE OF WEIGHT IN THE CHEST.

THERE has been no small perplexity felt by nosologists in arranging the various diseases which are chiefly characterized by irksome or distressful breathing. The lungs, like the stomach, maintain a close connexion with most of the functions of the body, and the organs which are instrumental to them; while the complaints affecting respiration that originate in the chest, run so frequently into each other, as to require the utmost nicety in drawing the line between what ought to be regarded as genera and what as species. There are three thoracic disorders that are peculiarly obnoxious to this remark; I mean those which among recent writers have been described under the names of dyspnœa, orthopnœa, and asthma. Celsus, following the Greek physicians, regards them as only modifications of the same malady, merely differing from each other in degree.

"Each," says he (*Medicinæ*, lib. iv., iv., 2), "consists in difficulty of breathing. When this difficulty is moderate and unsuffocative, it is called dyspnœa; when it is more vehement, so that the breathing is sonorous and wheezing, it constitutes asthma; and when it can only take place in an erect position, it is denominated orthopnœa. The first is usually a chronic affection, the latter two acute." Galen, on the contrary, treats of these diseases as distinct genera, and discusses them in remote positions.

The same diversity of view has occurred in modern times. Sir John Floyer and Dr. Bree have reduced the three divisions of Celsus to two, and have used the term ASTHMA as a generic name under which to arrange them. These two divisions are CONTINUED ASTHMA, and CONVULSIVE, or PERIODIC ASTHMA (*Inquiry into Disordered Respiration*, 5th edit., p. 231); the former being the DYSPNŒA of the Greek writers and of Celsus, and the latter uniting their ASTHMA and ORTHOPNŒA. I call these divisions rather than species, because Dr. Bree makes four subdivisions of the latter, derived from their supposed causes, and assigns the name of species to them when thus subdivided: though, if asthma be employed generically, it would perhaps be more consistent with the rules of classification to name the primary ramifications species; and the secondary, sub-species or varieties.

Almost all the continental writers make each affection a separate genus, as does Macbride among those of our own country. Cullen makes a genus of dyspnœa, as well as of asthma, but merges orthopnœa in the former; Dr. Parr and Dr. Young take as little notice of orthopnœa, and, with Celsus, reduce dyspnœa and asthma to the rank of species, under a genus which they denominate anhelatio or pneusis, which are a Latin and a Greek synonyme; the former of which is applied by Sauvages to an entire order.

Yet Dr. Cullen himself, in his First Lines, is untrue to his Nosology; for having in his earlier work arranged and defined dyspnœa as a distinct genus, in his later he expresses doubts whether under almost every modification, it is to be regarded otherwise than as a vicarious or symptomatic affection. On which account, probably, Dr. Crichton, though for the most part very

* Dyspnœa is generally only a symptom of disease. It is correctly observed by Dr. Williams, that as the elements or principal parts concerned in the function of respiration are three, namely, the blood, the respiratory machine, and the air, the causes of dyspnœa may arise from changes in any of these. Hence, in the consideration of this subject, he divides it, 1st, into derangements which interfere with the respiratory movements; 2dly, derangements which obstruct the passage of air to and from the pulmonary cells; 3dly, derangements in the pulmonary tissue, obstructing the action of the air on the blood. Dr. Williams conceives that the muscular act of inspiration is excited by a sensation arising from the presence of black blood in the lungs. The views adopted in the following passage should never be forgotten in the investigation of dyspnœa and asthma. "As the peculiar condition of the blood, which is called venous, is the immediate cause of the sensation of dyspnœa, so the blood being (if we may use the expression) *more venous* than usual, may give rise to the feeling of dyspnœa, without any derangement of the respiratory apparatus. Of this nature is the dyspnœa arising from violent exercise, which ceases as soon as the flow of venous blood to the lungs becomes moderated by rest. Whether other processes, such as increased secretions, the digestion of blood, &c., be capable of producing the like effect, that is, of so changing the blood, that although the respiration be healthy, this fluid is arterialized with sufficient rapidity to prevent the feeling of dyspnœa, is uncertain: but the stethoscope teaches us, that the function of respiration is more active in some individuals than in others, and that there is also a difference in the same individual at different times." Dr. Williams then adverts to individuals whose lungs are defective from disease, and who experience dyspnœa after taking food, though not usually sufferers from this complaint at other times. "It is," says he, "through the blood rather than in any other way, that diseases of the heart sometimes give rise to dyspnœa; any impediment to the pulmonary circulation causing imperfection in the oxygenating process."—Cycl. of Pract. Med., art. DYSPNŒA.—ED

scrupulous in adopting Dr. Cullen's views, has banished dyspnœa as well as orthopnœa from his catalogue, and has only retained asthma of the whole three. Dr. Wilson Philip seems to make little distinction in the use of the terms asthma and dyspnœa, for his habitual asthma and asthmatic dyspnœa are synonymous for the same disease, and run parallel with the present genus. —(*On Indigestion*, &c., p. 377, 384, 4th edit., 8vo., Lond., 1824.)

There is, nevertheless, a distinctive character, which, if steadily adhered to, may easily settle the question, and designate the proper place to which each respectively belongs. The difficulty of breathing is sometimes permanent; and sometimes recurrent, with considerable intervals of perfect ease; and, where it is permanent, it is occasionally distinguished by sudden and irregular exacerbations. These characters are clear, and cannot well be mistaken; and it is upon these pathognomonic marks that the arrangement we are now about to pursue has been founded. Dyspnœa distinguishes the cases of permanent difficulty of breathing; asthma, those of the recurrent; and orthopnœa, the cases of permanent difficulty of breathing with irregular exacerbations. The first two, therefore, form distinct genera; the last is necessarily a peculiar species of dyspnœa, linking it very closely with asthma.

Thus bounded and distinguished, dyspnœa, as a genus, offers us the two following species:

1.	Dyspnœa Chronica.	Short Breath.
2	——— Exacerbans.	Exacerbating Anhelation.

SPECIES I.
DYSPNŒA CHRONICA
SHORT BREATH.

THE BREATHING UNIFORMLY SHORT AND HEAVY; MOSTLY ACCOMPANIED WITH A COUGH.

The causes of this complaint exist in the chest locally, or in the habit or constitution generally: they are inbred, or the result of accident; and hence the disease exhibits the following varieties:

α Organica. Organic dyspnœa.	From organic deformity, oppression, or accidental injury.
β Extranea. Extraneous dyspnœa.	From calcareous or other spicular materials, inhaled while working on stones or metals.
γ Vaporosa. Mephitic dyspnœa.	From the mischievous action of metallic or other poisonous exhalations.
δ Phlegmatica. Phlegmatic dyspnœa.	From a phlegmatic or cachectic habit.
ε Pinguedinosa. Corpulent dyspnœa. Pursiness.	Accompanied with oppressive fatness.

When the chest labours under an ORGANIC DEFORMITY, or oppression, or the effects of an accidental injury, its cavity is contracted, and its motive powers are usually enfeebled, or curtailed in their action. This is by far the most frequent variety under which the disease makes its appearance. In some instances, the lungs have been found peculiarly small (*Sandifort, Observat. Anat. Pathol.*) and shrivelled (*Bonet. Sepulchr.*, lib. x., sect. i., obs. 45) in persons who have died of this complaint. [Laennec says, that they diminish in size only from the effects of external pressure, or in consequence of the growth of accidental productions within their substance, which may be considered as exerting a pressure from within outwards. This opinion he illustrates by a reference to what happens in cases of empyema and tubercles.—(*On Diseases of the Chest*, p. 147, 2d edit.)] The lungs are sometimes peculiarly hard, and cartilaginous in the duplicature of the pleura which surrounds them.—(*Schreiber, Nov. Comment. Petropol.*, iii., p. 395.) There has been adhesion between the folds of their membrane; or adhesion, sometimes ossification (*Schachier, Diss. de Ossificatione Præternaturali, Lips.* 1726), between the pleura and the ribs, sufficient to lay a foundation for difficulty of breathing. The lungs have been found loaded with hydatids, which have diminished their elasticity;* and sometimes these animalcules have been thrown up by coughing (*Ephem. Nat. Cur.*, dec. ii., ann. i., obs. 80); and still more frequently the lungs have been indurated by scirrhous, or oppressed with steatomatous, or other tumours.

In Bonet and other writers, we have also examples of internal oppression, and a diminution of cavity, produced by an excessive magnitude in the substance of the lungs, offering a sort of parabysma of this organ, so as to leave little room, and allow little elasticity for their proper play.† And still more generally the oppressive cause lies without, and the capacity of the chest is diminished by rickets, or a softness of the bones (*parostia flexilis*), or some accidental injury, by which the ribs or sternum have lost their proper form, and are become incurvated, and without a power of elevation.

In all these cases the healing art can do little. It may, perhaps, occasionally palliate some of the distress to which the patient is irrevocably doomed, but it cannot go further. Perfect tranquillity of body and mind, gentle exercise, a light diet, with a total abstinence from flatulent vegetables and fermented liquors, and an undeviating habit of regular hours, comprise, perhaps, the whole that can be recommended by the physician, or attempted by the patient. [Where dyspnœa depends on the presence of hydatids, or, as Laennec terms them, acephalocysts in the lungs, common salt appears most deserving of trial as a means of cure. Sheep which feed in salt meadows are exempt from

* Bonet. Sepulch., lib. ii., sect. i., obs. 33. Also, valuable observations on this subject, by Laennec, p. 373, 2d edit.

† Sepulc., lib. ii., sect. i., obs. 57, 58. Ruysch, obs. 19, 21. Eph. Nat. Cur., dec. i., ann. i., obs. 6. Id., dec. ii., ann. x., obs. 175; and Laennec on Diseases of the Chest, chap. on Hypertrophy of the Lungs, p. 146, 2d edit.

the rot and staggers, which are occasioned by the development of two species of vesicular worms in the abdominal viscera and brain. If attacked, a removal to such meadows generally cures them. Salt water baths have appeared to Laennec (Op. cit., p. 377) to benefit patients afflicted with analogous complaints. It is not necessary, he says, that the hydatids should be expelled, to effect a cure: it suffices if they be deprived of their vitality, after which their liquid is absorbed, the cyst shrinks into a small compass, and, upon cutting into the tumours, we find the hydatids quite flattened, and sometimes stratified with layers of albuminous and friable matter.]

Sawyers and hewers of freestone or other fossil masses; glass-cutters, china-manufacturers (See *Hastings on Infl. of the Mucous Membrane of the Lungs*, p. 273), lapidaries, and workers upon metals, are often subject to dyspnœa, from having the LUNGS LOADED WITH FINE PULVERULENT PARTICLES, detached from the materials on which they are employed, and floating in the atmosphere that surrounds them. And to these may be added, millers, starch-makers, horn and pearl-workers, needle, edge-tool, and gun-barrel grinders; and, for a like reason, weavers, wool-carders, and feather-dressers. This affection is so nearly similar to the variety β of *dry cough*, on which we have treated already, that it is only necessary to refer the reader to the remarks there laid down. The cause and mode of treatment are the same; and the symptoms chiefly differ from a difference of constitution. Where the lungs are peculiarly irritable, a troublesome cough will ensue from the first, before any considerable quantity of buoyant particles can have entered into the bronchiæ; but, where there is little irritability, no cough demanding particular attention has shown itself for years; and the lungs, from a habit of exposure to the same influence, have betrayed no uneasiness, till they have gradually been transformed into almost a mine or quarry of the material worked upon.—(*Hecquet, Maladies des Artisans*, tom. ii.) Various contrivances have been devised for straining off the floating particles from the air inhaled, and thus producing a preventive. Dr. Johnstone, long ago, proposed a muzzle of damp crape for this purpose; Dr. Gosse, a sponge; and M. D'Arcet an apparatus which he calls a fourneau d'appel: but, for workers in steel or iron, one of the most ingenious is a peculiar kind of magnet, that concentrates the metallic spiculæ, and thus prevents them from floating loose in the inspired air. It is an invention of Mr. Abrahams, of Sheffield, and has justly met with the approbation of the Society for the Encouragement of Arts.

[The doctrine of diseases of the lungs being produced by the inhalation of dust, and other extraneous particles, was considered by Laennec to be destitute of foundation. The dust, he observes, is quite dissimilar from the cretaceous formation occasionally met with in the lungs. Such productions he correctly regarded as the result of perverted secretion, and he had never met with them, except in dilated branches of the bronchiæ, or in the vicinity of old tuberculous excavations, cured by the formation of a fistula, or cartilaginous cicatrix. The production of cretaceous matter, he says, frequently succeeds that of tubercles.

Dr. Forbes coincides with Laennec respecting the secretion of the chalky matter; but differs from him in believing, with the author of this work, that the habitual inhalation of dust of various kinds is a frequent source of bronchial inflammation among various kinds of artisans, and more especially, in this country, needle-grinders, leather-dressers, and miners. An immense proportion of the miners in Cornwall, he says, are destroyed by chronic bronchitis, one cause of which is the inhalation of dust.]

Exposure to THE VAPOUR OF MINERAL acids, or of metallic or other mischievous exhalations, is also frequently found to produce a permanent difficulty of breathing. This affection is peculiarly common to those wretched beings who are condemned by the laws of their country to work in metallic mines as an expiation of crimes proved against them; a melancholy and interesting picture of whom is given by Diodorus Siculus, in his description of the mines of Arabia and Ethiopia. The air-cells of the lungs are often found constringed to half their proper capacity; whilst, in many mines, the vapours are so irritable as to excite a perpetual cough. They are loaded, according to the nature of the mine, with oxydes, sulphurets, or comminuted reguline particles of lead, copper, antimony, silver, arsenic. Metallurgists and the labourers in chymical laboratories are often severe sufferers from a like cause. Gold-refiners become dyspnœtic from inhaling the vapour of aquafortis. Etmuller gives an account of his having been seriously injured in his breathing while carefully superintending an antimonial preparation.—(*Rammazini, de Morbus Artificum.—Ephem. Vratisl.*) And Heurnius saw the lungs of a printer, so changed by inhaling an atmosphere impregnated with lead, as to resemble a shrivelled apple.

The treatment of this variety must be regulated by the variety of the cause; but, perhaps, in all cases, a free inhalation of oxygen gas will be serviceable. An inhalation of moderately stimulant vapours, as of an infusion of lavender, marjoram, and, indeed, most of the verticellate plants, or of diluted wine-vinegar, has also proved frequently of use; to which may be added, a current of the electric fluid passed two or three times a day from the upper part of the spine to the diaphragm. An atmosphere impregnated with tar heated over an oil or spirit lamp, has also in many instances been found essentially to invigorate the respiratory powers; and to these, where there is much cough, should be added expectorants and the warmer demulcents. After pursuing this plan for some weeks, pure air and the aërated mineral waters, where the case is not inveterate, will add a healthy degree of tone, and restore the respiratory organs to their natural action. Galvanism has also occasionally produced considerable, and,

in some instances, permanent relief, after a few applications; the opposite wires being applied, the one to the nape of the neck, and the other to the lower part of the epigastric region, and each fixed upon a thin plate of metal wetted with water, as recommended by Dr. Wilson Philip.—(Op. cit., p. 379.)

We sometimes find a permanent difficulty of breathing in persons labouring under GREAT TORPOR OR SLUGGISHNESS OF VASCULAR ACTION. The pulse is slow and unresisting; the muscles are soon fatigued; the mind has little energy; the face is pallid; the skin cold and soft: the urine scanty, and the extremities œdematous, without any pathognomonic symptoms of dropsy in the chest, or at least any sensible fluctuation in the thorax. It is the *dyspnœa aquosa* of Cullen, and the *dyspnœa pituitosa* of Sauvages. Whatever has a tendency to depress the living power, and particularly in flaccid and atonic habits, will readily lay a foundation for this variety of dyspnœa; and hence it is a frequent result of catching cold in the feet, and, still more frequently, of suppressed perspiration. It also occasionally follows chronic catarrhs, and pneumonitis.

A tonic and gently stimulant plan, consisting of the warm gums, camphire, and other terebinthinates, the warmer bitters, the oxydes of zinc and iron, the compound squill pills, the warm-bath, moderate exercise, and a generous diet, will be the most successful mode of treatment; occasionally interposing antimonial emetics; which will relieve the lungs far more effectually than those of ipecacuanha, as operating longer on the moving powers of the chest. Of the terebinthinate tribe, the best, perhaps, is the balsam of copayva, given in doses of a drachm or a drachm and a half three or four times a day. Nothing succeeds so well in restoring the secretion of mucus where it has ceased or become deficient; or in producing a healthy discharge where its nature has been changed by morbid action: on which account, this medicine may almost be regarded as a specific in morbid secretions of mucous membranes, whether of the lungs, the intestinal canal, or the urethra; as it has often proved highly serviceable in croup. The chief difficulty is in devising a convenient form for its exhibition, since it sometimes excites nausea.

The variety of least moment, perhaps, to the dyspnœtic patient, is that which proceeds from, or is accompanied with, a short, stunted figure, and considerable corpulence, or, at least, OBESITY OF THE CHEST. We see persons of this description, significantly described by the colloquial term *pursy*, pant, and perspire, and grow fatigued, day after day, upon very little exercise, and yet press on without any serious inconvenience to a late period of life; or, if they sink suddenly and sooner, they yield rather to apoplexy as a result of their general habit, than to the idiopathic affection before us. [According to Laennec, this case is in a great measure nervous, and is to be attributed to the great expenditure of nervous influence, required to move a mass so disproportioned to the ordinary powers of motion.—(Op. cit., p. 404.)] Abstinence from spirits, wines, and fermented beverages, a meager allowance of animal food, a soluble state of the bowels, and exercise, rather persevering than violent, will form the best plan for the present ease, and the best guard against threatened mischief. Bleeding has often been tried, but it affords only temporary relief. Sauvages gives us the history of a female, who for two years had been so far suffocated, that it had often been judged necessary to bleed her three times a day at least, and she had undergone not fewer than two thousand venesections, when she applied to him. She was plunged into a warm bath, the bath was frequently repeated, and friction at the same time made use of, so as to excite violent perspiration: by this means she was convalescent in ten days.

Dyspnœa has also sometimes been produced by causes somewhat more singular, as common respirable air obtaining an entry into cavities in the chest, or to which it does not naturally belong. Stoll gives a case of dyspnœa, in which air-bladders, or vesicles, were seated on the surface of the lungs.—(*Rat. Med.*, part vii., p. 135.) [This state is particularly described by Laennec (Op. cit., p. 149) in his valuable account of emphysema of the lungs: after mentioning the enlargement of the air-cells, he says, sometimes we observe on the surface of the lungs single vesicles, distended to the size of a cherry-stone, or even larger, quite prominent, exactly globular, and apparently pediculated. The term *apparently* is used, because, on cutting into them, we find that there is no real pedicle, but merely a constriction at the point where the cell begins to rise beyond the surface of the lungs. The dilated cell, in fact, communicates with the adjoining ones and the bronchiæ; and the case is not one of a mere extravasation of air under the pleura. What he calls pulmonary emphysema consists essentially in the dilatation of the air-cells; and the projection of air on the surface of the lungs, constituting the larger and more prominent vesicles, is a posterior affection, and of slight importance, compared with the dilatation of the cells; because hopes may be entertained of its removal by absorption, while we cannot well see how nature or art can remedy the other morbid alteration, which, however, Laennec does not pronounce absolutely incurable.] Gooch and various others mention examples of air let loose between the lungs and the pleura. In Timæus we have a specimen of a very extraordinary idiosyncrasy, giving rise to a difficulty of breathing upon an inhalation of the smell of roses.—(*Case*, p. 216.) The morbid influence of metallic action is not confined to vapour locally applied; for in Schenck we have a case of dyspnœa produced by mercurial inunction (*Observat. Rar.*, lib. ii., p. 63); and, in other books, of a like effect on peculiar constitutions by a solution of the oxydes of lead taken internally, or even applied externally.—(*Eph. Nat. Cur.*, dec. iii., ann. iv., obs. 30.)

[According to Laennec (Op. cit., p. 151), some of the air-cells of the lungs of subjects

who have long suffered from any kind of dyspnœa, are almost always found preternaturally dilated. In other words, these organs are in a state of *vesicular* or *pulmonary* emphysema, which he distinguishes from the *interlobular*, well known to surgeons. He looks upon vesicular emphysema as being almost always the consequence of dry catarrh, and presenting the same indications of cure. "Frictions with oil are often very useful in lessening the susceptibility to be affected by catarrh. In the case of pallid, cachectic subjects, the subcarbonate of iron has occasionally seemed to have a similar effect, and to tend at the same time to diminish the congestion of the mucous membrane, and spasmodic stricture of the bronchiæ. In the severer asthmatic paroxysms, it is frequently necessary to have recourse to venesection, in order to relieve the congestion of blood in the lungs; and it is always proper to diminish the necessity of respiration by means of narcotics."]*

Chronic dyspnœa appears also as a symptom or sequel in various other diseases, or affections of various other organs; as aneurism, ossification, or other mischief in the heart, or aorta; any morbid change in the diaphragm, ribs, or pleura, by which the cavity of the thorax is diminished, or the moving powers restrained in their action; parabysmic enlargements of the liver, spleen, or omentum; whence it is obvious, that it must, in a greater or less degree, be an attendant on the latter period of pregnancy. It has also followed occasionally, not only suppressed perspiration, but the suppression of various cutaneous eruptions, and in a few instances, the sudden closure of an issue, or seton, of long standing.†

SPECIES II.
DYSPNŒA EXACERBANS.
EXACERBATING ANHELATION.

THE DISEASE SUBJECT TO SUDDEN AND IRREGULAR EXACERBATIONS; BREATHING DEEP, STERTOROUS, ACUTE, AND SUFFOCATIVE; RELIEVED BY AN ERECT POSITION.

This species admits of most of the varieties of the preceding, which it is hence unnecessary to repeat; and, like it, is often found as a symptom in aneurisms, polypous concretions, and other affections of the heart and larger vessels; in parabysma, and other affections of the abdominal viscera; in empyema, dropsy of the chest, worms, peripneumony, bastard peripneumony, smallpox, and occasionally in severe accessions of intermitting fevers. I have already, indeed, stated, that there is scarcely a function with which the action of the lungs is not connected, and, consequently, scarcely a disease of any importance in which it does not occasionally participate. Whatever be the cause that produces anhelation, or permanent difficulty of breathing, in a patient, any accidental augmentation of it, or any sudden excitement of body or mind, or any diseased action of any kind, capable of uniting with the primary cause, directly or remotely, will increase its power, and not unfrequently induce a spasmodic constriction in the muscles of respiration. And it is this accidental exacerbation, produced irregularly by casual and often occult causes, and especially in irritable or nervous temperaments, that peculiarly distinguishes this species from the preceding. In asthma the returns are for the most part strictly periodical, and the intervals perfectly free from difficulty of breathing. In exacerbating dyspnœa the constriction occurs with the utmost irregularity, in the daytime, at night, in hot or cold weather, in a moist or dry atmosphere, and it is hence sufficiently distinguished from asthma. A catarrhal cough will sometimes prove an occasional cause; several of the varieties of heart-burn, and especially *cardialgia syncopalis*, still more frequently; other causes are, indigestible food, a fit of hysterics, or any violent commotion or agitation: while, as already observed, the occasional cause is often beyond the power of detection.

When the constrictive paroxysm makes its attack, it must be immediately opposed by an erect position, without which suffocation would often instantly ensue; and by the most powerful antispasmodics. Tincture of opium, ether, and ammonia, are what I have chiefly trusted to, and have uniformly found far more to be depended upon than castor, or any other odorous antispasmodics, in whatever quantity given. A large blister to the chest should also be immediately applied; and, if the paroxysm do not yield soon, sinapisms to the feet. Upon its cessation, the gum-ammoniac mixture, or a solution of asafœtida, with camphorated tincture of opium, will be found a convenient guard against fresh attacks, provided due attention be paid to the state of the bowels, which ought indeed to form an early consideration. Issues have been recommended as a preventive of the paroxysm, where its approach has been expected, and I

* Moderate venesection will be found useful in several of the forms of dyspnœa noticed by the author, particularly in that arising from great torpor or sluggishness of the vascular action.—D.

† Riedlin, Lin. Med., 1695, p. 91. There is a form of dyspnœa, noticed by Laennec, and described by him as a "*besoin de respirer*," and by Dr. Williams, as a case of "*increased want of breath*;" a disorder which the latter physician refers to the venous condition of the blood being augmented beyond its natural standard. If not idiopathic, this affection, he thinks, cannot be ascribed to any distinct disease. It is to be detected only by the absence of the signs of every other cause: when, therefore, a dyspnœa occurs, while pure air is found to penetrate freely into every part of the lungs, and the diseases, which modify the state of the bronchial membrane and its secretion, have not existed, the disorder, as Dr. Williams conceives, must be necessarily referred to an unusually venous or carbonized state of the blood; the result, perhaps, of "an excessive formation of those secretions, which are, in relation to the blood, defective in carbon" (Cyclop. of Pract. Med., art. Dyspnœa), as, for instance, urea. Belladonna, stramonium, and conium, are the medicines which Laennec preferred for the relief of the "besoin de respirer."—Ed.

have sometimes thought them of efficacy. For this species, however, perhaps the most effectual means of relief are to be derived from the application of the voltaic battery, as already proposed for anhelation from poisonous vapours; and as has been successfully tried in numerous instances of the present species by Dr. Philip, who was first induced to apply this remedy from observing that animals, whose eighth pair of nerves had been divided, exhibited the oppressed breathing and accumulation of phlegm that characterize both species of dyspnœa, and were relieved by having a stream of voltaic aura sent through the lungs.

The accompanying cough, instead of being increased by the use of the voltaic power, is hereby diminished, in consequence of its diminishing the accumulation of phlegm in the lungs. In proper asthma, which is characterized by intervals of free and healthy breathing, little or no benefit has been derived from this process; and hence Dr. Philip very ingeniously reasons, that although in both diseases the nerves of the respirable organ are alone in a morbid condition, and not the brain or spinal marrow; yet, in the former, they are still capable of being recalled to a state of healthy activity, or of becoming sufficiently cleared to form a passage for the supply of nervous influence to the lungs, which effect he supposes to be obtained by the use of the voltaic machine.

The American pathologists have found great benefit from various preparations of the *lobelia inflata*, or Indian tobacco, which certainly possesses powerful antispasmodic and expectorant virtues; and has hence a fair claim to more extensive trial than it has yet received. The ordinary form is that of a saturated tincture of the leaves, prepared by digesting two ounces in a pint of proof spirit: the dose of which is from a tea-spoon to a table-spoonful, repeated every half hour, or oftener, till the paroxysm is conquered.*

GENUS IV.
ASTHMA
ASTHMA.

DIFFICULTY OF BREATHING TEMPORARY, RECURRENT; ACCOMPANIED WITH A WHEEZING SOUND AND SENSE OF CONSTRICTION IN THE CHEST; WITH COUGH AND EXPECTORATION.†

Asthma, as already observed under dyspnœa, is closely connected with the latter, and particularly with its second species, characterized by what might be strictly called asthmatic exacerbations, and which I have hence denominated *dyspnœa exacerbans*.

The definition of the disease now offered, while it shows the proximity of the one to the other, is sufficient, if I mistake not, to form a marked and accurate distinction. The vulgar term for the complaint in our own language is *broken-wind*; which, as scientific precision is seldom an object of popular language, is often also applied to some of the varieties noticed under dyspnœa, or *short-breath*.

Asthma is more commonly a disease of the later, than the earlier period of life; for it does not often appear in infancy or youth, although occasional instances of this have occurred, particularly in infancy, that have been mistaken for cases of croup, which the asthma of infancy very much resembles, though admitting of a more easy cure.* It soon becomes habitual, and seems sometimes to be hereditary.

Asthma afflicts both sexes, but is more common in the male than the female. It makes its appearance in individuals of every variety of constitution, a necessary result, as Dr. Forbes remarks, of its frequent dependance on other diseases of accidental occurrence; but what are called nervous temperaments are those in which the disorder occurs with remarkable frequency, and the same observation may be made with respect to plethoric individuals, with a full hard pulse, a short neck, high shoulders, a great deal of fat, and a voluminous head. It is supposed to be more common in temperate climates, than in either the very cold or the very warm regions of the earth.† Frank found it more common in Poland than Italy.—(*Frank, Med. Univ. Prax.*, tom. vii.)

The paroxysms of asthma are frequently preceded by languor, flatulence, headache, heaviness over the eyes, sickness, pale urine, disturbed rest, and a sense of straitness, fulness, and anxiety about the præcordia. "When the evening approaches," says Dr Bree (*Inquiry into Dis. Respiration*, sect. iv., p. 46), who unhappily describes from his own history, "the weight over the eyes becomes more oppressive, and the patient is very sleepy. Frequently, at this period, there is a tingling and heat in the ears, neck, and breast; and a motion to expel the contents of the bowels is attempted, with

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* A Treatise on the Materia Medica, &c., by John Eberle, M. D., 2 vols., 8vo., Philadelph., 1822. Also Dr. Andrew's Report in Glasgow Med. Journ., vol. i., p. 177.

† "A difficulty of breathing, recurring in paroxysms, after intervals of comparative good health, and usually unaccompanied by fever."—(Forbes in Cycl. of Pract. Med., art. Asthma.) The greater number of writers agree in meaning by *asthma* "a disorder of the respiratory organs, characterized by intermittent or remittent dyspnœa, the attacks of which usually occur during the night, attended by circumstances, which are noticed more or less in all cases, where there is some obstacle to the mechanism of respiration."—Jolly, Dict. de Méd. et de Chirurgie Pratiques, art. Asthme, 1829.—Ed.

* Asthma, according to the definition commonly given of it, is sometimes considered to be less a disease of old persons, than of adults not so far advanced in years; for the dyspnœa, and disturbance of the respiratory functions, often noticed in aged individuals, are mostly dependant upon organic diseases of the heart, or great bloodvessels, as M. Rostan has satisfactorily proved.—Ed.

† The prevalence of asthma seems to depend more upon the humidity of the atmosphere than upon its high or low degree of temperature. It is more likely to affect individuals on the seaboard than in the interior, and is seen in Boston and New-York more frequently than in Philadelphia.—D.

some violence, and with great uneasiness of the abdominal muscles. When an asthmatic feels these warnings, he may be convinced that his enemy is at hand."

The accession is usually about the middle of the night, and during the first and deepest sleep: the cause of which has not been rendered very manifest, though I do not think it beyond the reach of explanation, and especially in constitutions predisposed to the disease by habit, or hereditary affection. Respiration always takes place most easily in a raised or erect position, but in the night the body is recumbent. Respiration is also so much of a voluntary action, that although it continues during sleep, and when the will is not exerted, it is considerably aided by the concurrence of the will. Now, during sleep, this concurrence is wanting; and hence the most favourable period for the attack of this insidious complaint is that, in which we actually find it makes its appearance—during a recumbent position of the body, when the muscles of respiration are destitute of the stimulus of volition. When the disease indeed has once established itself and become habitual, it will recur at other times also, but less frequently.

For the most part, the patient wakes suddenly, and feels a most distressing tightness about the chest, as if he were bound with cords: his anxiety is inexpressible, and he labours for breath as though every moment would be his last. He is obliged to sit erect, breathes distressfully with a wheezing sound, and cannot bear the weight of the bedclothes. Cool fresh air is the object of his intense desire.* At the same time, the extremities are cold; the heart palpitates; the pulse is sometimes quickened, but usually weak, irregular, and often intermitting; the abdomen is distended with flatulence; the stomach is faint, and often rejects with great violence a slimy and frothy material of a greenish or yellowish hue. The eyes stare prominently, and the face is sometimes pale, but more commonly bloated and livid; and the alvine canal, though costive before, will now perhaps pass a loose stool.

In many instances, there is an ineffectual effort to excrete, with a harsh and dry cough that brings up nothing more than a little clammy or frothy mucus. And in these cases, the fit usually subsides, or perhaps altogether leaves the patient in two or three hours. But, in other instances, the cough is far more violent and suffocative; and when it has lasted for an hour or two, an expiration of tough viscid mucus commences, and gradually becomes copious and affords relief. It is occasionally mixed with blood from the severity of the struggle; but the larger the discharge of either, or of both, the more the bronchial vessels are relieved.

It is often, however, many hours before a paroxysm of this kind very sensibly subsides; and the patient generally feels some degree of constriction during the whole of the ensuing day; and is fortunate, if the next night be passed without a similar fit. The tendency to such returns usually continues for several nights; in severe cases, for a week or fortnight. Sir John Floyer, who, from describing his own sufferings, has given us one of the best historical accounts of the disease that has ever been written, mentions a case, in which the fits recurred for seven weeks together; during the whole of which time the patient was obliged to sit erect in a chair.

Yet, notwithstanding the violence of the assault, it is not often that asthma, under either of these forms, proves fatal at the time: for this "morbus maximé terribilis," as it is called by Willis, "may be carried on to old age, if supervening diseases do not destroy the patient, or disturb the operations of nature, by which a recovery from the paroxysm may be obtained."* But it rarely makes a first attack without subjecting the constitution to subsequent returns; and frequently, by the debility which it hereby produces, lays a foundation for tubercular phthisis, dropsies of the chest or abdomen, aneurisms of the heart, and various other fatal diseases [which, however, according to the editor's reasoning, should generally be considered as causes, and not as effects of the disturbance of respiration]. While it occasionally happens, even where none of these take place, that the mucous glands of the bronchiæ become relaxed, an habitual excess of secretion ensues, and a troublesome dyspnœa is the consequence, from the overloaded state of the air-cells and bronchial vessels; a mischief, which, in such cases, is felt most oppressively on first awaking, and is only relieved by a long labour of severe coughing. This overloaded state of the bronchiæ and air-cells, from too large a secretion of mucus, is indeed, at the time, an original exciting cause of the disease; and has by some writers, and especially in our own day by Dr. Bree, been supposed to be the chief cause.

The exciting causes, however, are numerous, and it is difficult to say which is the chief; nor always easy to ascertain them satisfactorily. Yet they may all be resolved into an irritation of some kind or other, existing within the cavity

* Dr. Forbes has known a poor patient, in such circumstances, not merely remain by the open window, but lean over it, resting on the sill, with the arm hanging on the outside, for several nights together, and even in winter.—(Cyclop. of Pract. Med., art. ASTHMA.) Exposure to cold during a paroxysm of asthma rarely causes any immediate or subsequent ill consequences, a fact which appears to Dr. Forbes to prove how profoundly and extensively the nervous system is involved in the attack.—ED.

* Bree's Inquiry, &c., sect. vi., p. 71. Asthma hardly ever proves fatal as asthma, that is, in the paroxysm; but, as Dr. Forbes has very correctly explained (Cyclop. of Pract. Med., art. ASTHMA), its frequent recurrence not merely aggravates the pathological states in which it has originated, but leads directly to the production of other diseases. "The most common of these," he says, "are emphysema of the lungs, dilatation of the heart, hydrothorax, and other forms of dropsy. But," adds this well-informed physician, "if asthma is rarely fatal, it may be said to be almost as rarely cured, if this epithet is applied only to the entire and permanent removal of the disease. It is, however, frequently susceptible of great mitigation and retardation of the paroxysms."—ED.

of the chest, and stimulating its moving powers to a convulsive constriction.* I say existing *within* the cavity of the chest, because we are now considering asthma as an idiopathic disease. Yet it happens not unfrequently, that it occurs as a mere symptom, or result of some other disease, or of a morbid state of some remote organ, as the stomach, liver, or spleen; in which case, it becomes a secondary affection, and is only to be removed by removing the primary disorder on which it is dependant.†

[The ancients confounded, under the name of *asthma*, several varieties of dyspnœa, arising from different organic diseases, and which they very incorrectly regarded as nervous affections. To Corvisart and Rostan‡ belong the merit of having thrown a great deal of light on those varieties, in particular, which depend upon organic diseases of the heart and large blood-vessels.]

Whether the suffocative tightness of the chest be the result of a spasmodic stricture of the bronchial vessels, spreading thence to the muscles of respiration, or produced by an infarction of these vessels from a superabundant effusion from their exhalants, is a question of a very different kind. Willis first started the former opinion, which has flowed in a regular current, or with little opposition, through Floyer, Hoffmann, and Cullen, to the present day. [Its possibility has lately received important corroboration from the anatomical researches of Reisseissen (*F. D. Reisseissen Ueber den Bau der Lungen.*, Berl., 1822), who has ascertained the existence of a set of completely circular fibres around the bronchial ramifications, beginning at the point where the cartilaginous circles terminate. Laennec (Op. cit., p. 408) has also verified the correctness of this observation upon branches of less than a line in diameter; and he remarks that, although it be difficult to follow the muscular fibres to a greater distance, analogy leads us to admit their existence, certainly in the smaller branches, and, perhaps, even in the air-cells. Adopting this view of the subject, he conceives that the spasmodic contraction of these fibres may take place in such a degree as to prevent the transmission of air to a great portion of the lungs. It is also further maintained by Laennec, that the study of respiration, by means of auscultation, furnishes us, both in health and disease, with proofs of the lungs possessing an inherent power of action. This author is too intelligent, however, to refer asthma exclusively to the operation of any single uncombined cause.] Dr. Bree has lately proposed the second doctrine above specified, and supported it with great ingenuity and learning; illustrating and fortifying his views by numerous references to unquestionable facts, and the opinions of earlier writers. The same principle, or at least a modification of it, has been adopted by Dr. Parry, who places the vascular turgescence in the mucous membrane lining the bronchial cells.

Admitting the former hypothesis, the thoracic convulsion is a diseased action from the beginning, and under every degree and modification, and is so regarded by its advocates: while Dr. Bree only allows it to be so when the convulsive action is violent; contending that in its commencement it is altogether a remedial effort, an instinctive attempt to expel the serum or mucus that clogs the bronchial vessels. And he hence accounts for the pathognomonic wheezing, which he does not think the idea of a spasmodic stricture of these vessels is sufficient to explain; as also for the general inefficacy of opium and antispasmodics, to whatever extent they may be carried.

I have already stated, that an excessive secretion from the exhalants of the bronchiæ may be an exciting cause in many cases, and particularly in a relaxed and debilitated condition of the bronchial vessels in consequence of former attacks. But, notwithstanding the masterly manner in which Dr Bree has argued this point, I cannot regard such a secretion as a common cause of asthma, since, in numerous instances, I have observed in the words of Sir John Floyer, that "the lungs do not appear to be much oppressed with phlegm before the fit; and, at the end of the fit, the straitness goes off *before* any considerable quantity is spit up:" while in what is commonly called the dry, nervous, or convulsive asthma, there is always very little, and sometimes no mucus whatever, excreted from the beginning to the end of the paroxysm. It may, indeed, be maintained, that the secretion is absorbed, but this is to beg the question, for we have no proofs of such an absorption. The existence of accumulated mucus in the bronchial vessels of those who have died of asthma, and whose bodies have been opened, does nothing more than establish the fact in those particular cases. And even here we are left in total darkness, whether the serum or mucus anticipated the suffocative convulsion, and was the cause of it, or whether the latter anticipated the serous or mucous effusion, and forced it into the vessels in which it has been found on dissection. How far the suffocative convulsion may originate in a spasm of the bronchiæ, as contended for by Dr. Cullen, we have no means of determining manifestly. That it may exist, however, as well as a spasm of the alimentary canal, no one has been bold enough to deny; that it must produce that strangling constriction or straitness which is a pathognomonic sign of asthma, where it does

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* On this part of the subject, what Willis has stated is put, as Dr. Forbes has rightly observed, in pithy terms:—"Asthmatics can bear nothing violent or unusual. From excess of heat or cold, from any great bodily exertion, or mental emotion, from change of season or weather, from errors, even slight kind, in the non-naturals, and from a thousand things besides, they fall into fits of dyspnœa."—De Med. Op., p. 209.—Ed.

† Among the predisposing causes may be enumerated hereditary transmission; malformation of the chest; small size of the glottis; excessive irritability of the bronchial membrane; and all diseases which directly affect it, as catarrhs, bronchitis, &c. But of all the predisposing causes of asthma, dyspepsy is the most frequent.—Ed.

‡ L. Rostan, Mém. sur cette question: l'asthme des vieillards est-il une affection nerveuse?—Paris, 1809.

exist, can be as little doubted; and I find it extremely difficult to ascribe the disease to any other state of the bronchiæ, in all cases of dry or nervous asthma, in which, as there is little or no discharge from the lungs, we have full ground for inferring, that there is little or no accumulation within them. "It is not, however, intended," says Dr. Bree, "to deny the possible existence of this spasm, but to object to it as a proximate cause; and to state the imprudence of depending upon it as an important indication in practice."—(*Inquiry*, &c., sect. vii., p. 106.) Yet it does not appear to me, that the practice suggested by the one opinion needs to be so much at variance with that suggested by the other, as this passage would seem to intimate. For, if acids prove a beneficial mode of treatment, and that benefit be ascribed by the upholder of the muculent hypothesis to the astringent power of the acid, by which the flow of mucus is restrained; it may be ascribed by the upholder of the spasmodic hypothesis to the very same power, by which, as a tonic, it takes off irritability, and allays all muscular irregularities.

[Laennec (Op. cit., p. 405–407) has divided the form of asthma, in which no organic lesion is discoverable, into two kinds; in one, when the chest is examined with the stethoscope, the respiration is very sonorous, like that of children; and hence he calls the disease *asthma with puerile respiration.** In this instance, the patient constantly feels the want of a more extensive respiration than what he enjoys. The dyspnœa is frequently very intense, and is sometimes so aggravated by the slightest motion, that the patient is condemned to a life of inactivity. Laennec ascribes the disease to the state of the nervous system. He has never met with this species of asthma, except in persons affected with chronic mucous catarrh. The other form of asthma noticed by Laennec as unconnected with organic disease, is what he names, with other writers, *spasmodic asthma*.]

Dr. Bree's division of the disease is founded upon causes, rather than upon symptoms; and he has hence divided it into the four following species:—Firstly, those cases, being most numerous and common, which are produced by the irritation of effused serum in the lungs. Secondly, those produced by the irritation of aerial acrimony in the lungs. Thirdly, those dependant on irritation in the stomach, or some of the abdominal viscera, and fourthly, those dependant upon habit.

[The author of the present work has not adverted to the valuable writings of Laennec on this subject, who shows that the most common cause of dyspnœa, when of sufficient severity to be termed asthma, is a dry catarrh inducing emphysema of the lungs, that is to say, a preternatural dilatation of the air-cells. In some rare cases, where the progress of œdema of the lungs is very slow, asthmatic symptoms may also be produced. These morbid states have been amply verified by morbid anatomy.]

As the definitions, under the present classification, are founded upon a principle of symptomatology rather than of etiology, it will not be in my power to adopt Dr. Bree's divisions in the exact terms and order in which he has given them; though it will be found that his first two species run nearly parallel with the only two to which I propose to limit the genus; and which will be wide enough to embrace his fourth, or those cases of the disease which, whatever be their symptoms, depend on an established habit: while the third species of Dr. Bree, comprising cases in which asthma is not an idiopathic affection, but a sign or result of morbid action in some organ remote from the lungs, cannot be correctly treated of in the present place; the affections included under it being alone to be remedied by remedying the primary disease on which it is dependant.

From the view then thus offered, and from other symptoms that we shall have presently to take notice of, it will, I think, be found convenient to contemplate the genus ASTHMA, as comprising, and limited to, the two following species:

1. Asthma Siccum.	Dry Asthma.	Nervous Asthma.
2. ——— Humidum.	Humid Asthma.	Common Asthma.

SPECIES I.

ASTHMA SICCUM.

DRY ASTHMA. NERVOUS ASTHMA.

PAROXYSM SUDDEN, VIOLENT, AND OF SHORT DURATION; CONSTRICTION HARD, DRY, SPASMODIC; COUGH SLIGHT; EXPECTORATION SCANTY, AND ONLY APPEARING TOWARDS THE CLOSE OF THE FIT.

THIS is the proper convulsive or nervous asthma of Willis, Hoffmann, Floyer, and Akenside. Its predisposing cause we are sometimes capable of developing; for we can trace the disease to a morbid structure of the chest, to an irritable condition of the bronchial vessels, or parenchyma of the lungs, produced by a pleuritis, or a succession of severe and protracted winter coughs, or to an hereditary source. Of the occasional causes, however, we are often in great ignorance; and mostly so where the disease appears in its simplest character, and to-

* Dr. Forbes has given the following explanation of what is revealed by the stethoscope, which "conveys scarcely any respiratory sound during inspiration, except an indistinct hollow sort of murmur, altogether unlike the usual respiratory sound, and so slight as to leave it doubtful if the impression conveyed to the ear is really a sound or vibration. Expiration, however, is distinctly marked over the greater part of the chest; not, indeed, by the sound of healthy respiration, but by a loud, sibilant, or dry sonorous rhonchus, corresponding with the loud sighing wheeze, audible by the naked ear. This rhonchus is often exactly like the sighing of wind through crevices; and sometimes the tone and key of the sound approach nearer those of a moan than a sigh. The sounds are perceptible during expiration over the whole chest, even in the extreme points of the lungs; and equally so in patients, whose respiration is nearly inaudible in the intervals of the paroxysms."—Cyclop. of Pract. Med., art. ASTHMA.—ED.

tally unconnected with any other affection. In some instances, it evidently follows the sudden repulsion of cutaneous eruptions; in others, the sudden cessation of œdematous swellings in the extremities of cachectic patients; and, not unfrequently, the inhalation of deleterious exhalations: most of which we have already noticed as occasional causes of dyspnœa, and dry or humid cough. So that it is probably a mere difference in the constitution or habit that renders these causes capable of producing one of these diseases rather than another. And hence dry asthma, like the preceding, as thus diversified by its occasional causes, may be contemplated under the following varieties:—

α Simplex. Simple nervous asthma.	Without any obvious cause or connexion with any other affection.
β Metastaticum. Repelled eruptions.	From retropulsion of some cutaneous affection.
γ Phlegmaticum. A cachectic frame.	From repelled œdema of the extremities in phlegmatic or cachectic habits, with a scanty secretion of urine.
δ Vaporosum. Deleterious exhalations.	From inhaled fumes of metals, especially of lead and arsenic; of sulphur, charcoal, nitric acid, and other deleterious or poisonous substances.
ε Organicum. Organic misformation.	From organic derangement of the walls or contents of the chest.

The FIRST OF THESE varieties constitutes the second species of Dr. Bree, who supposes the unknown and exciting cause to reside in some "subtile acrimony *always* present in the atmosphere in a greater or less degree, and ready to be inspired."—(*Inquiry*, &c., p. 192.) It is at least difficult to disprove this opinion; but, admitting the fact, we can make little use of it, and are nearly as much in the dark as ever.

It is a position of far more general assent, that this modification of asthma is more likely to occur "in proportion as the habit is disposed to the condition called nervous."—(Op. cit., p. 191.) The paroxysm, indeed, frequently makes its attack under those circumstances, which are most apt to try the strings of a nervous temperament. A sudden emotion of the mind will give rise to it; an alteration of the wind, a change of residence, or a meal that disagrees with the stomach; and often there is a considerable evacuation of pale urine: while on the contrary, as already observed, it more usually makes its attack without any one of these harbingers, or any other that can be traced out. The small quantity of viscid mucus that is excreted through the whole of the struggle, proves evidently, that the inner membrane of the bronchial vessels is in a state of peculiar dryness; and leads us to conceive, that, at the onset, it was nearly or altogether destitute of its lubricating fluid. It is on this account that the cough and wheezing are both slight.

[According to Laennec, an attack of purely nervous asthma is rarely fatal, and indeed is hardly ever so, without previously giving rise to congestions of blood, and other consequences of the disorder of the respiration and circulation induced by it: and, in these consequences, he observes, prejudiced minds may see the causes of the disease. He has met with many cases, however, in which it was impossible, after the most minute research, to find any organic lesion whatsoever, to which the asthma could be attributed. An instance of this is given by M. Andral in the case of a fatal suffocation, following the suppression of a discharge from an ulcerated leg.—(*Clin. Méd.*, tom. ii., obs. 20.) M. Guersent records the cases of two children who died in a few days of a remitting dyspnœa, attended with dry cough and præcordial anxiety, in whose bodies no obvious lesion could be found after death.—(*Dict. de Méd.*, tom. iii., p. 126.) Laennec is convinced that, in the greater number of asthmatic cases, depending on dry catarrh and pulmonary emphysema, the asthmatic paroxysm can be induced equally by the supervention of a fresh catarrh, and by a deranged state of the nervous influence, occasioning pulmonary spasm, or an increase of the necessity of respiration, and sometimes by both causes at once. He believes, in fact, that few cases are owing to any one of these causes; and that, in old men particularly, several are frequently concerned. Of this kind are debility; ossification of the cartilages, and immobility of the ribs; rheumatism affecting the walls of the chest; and, perhaps, also, the tenuity of the air-cells, and of all the pulmonary vessels in advanced life. With the exception of the different kinds of catarrh, the occasional causes of the attacks of asthma are almost always such as are calculated to produce immediate and evident disturbance of the nerves; a strong mental emotion; venereal excesses; the influence of light and darkness; retrocession of gout; certain odours, such as those of tuberose, heliotrope, stored apples, &c.; changes of the atmospheric electricity, and other less appreciable conditions of the atmosphere. We find that the greater number of asthmatic patients cannot remain with impunity in a low, close apartment, although containing much more air than they could consume in twenty-four hours; and although it is constantly, but insensibly renewed by the doors and chimneys. Some cannot bear any person to go before them, or any thing to be brought close to them, without experiencing a sense of suffocation; while others are never more subject to dyspnœa than in the midst of a large plain.*]

* See Laennec on Diseases of the Chest, &c., 2d edit., p. 412. Dr. Henderson notices a disorder in India, exactly corresponding to our spasmodic asthma, and which appears to attack poor individuals, whom accident has deprived of their usual daily allowance of opium. The disorder

Cases of the species of asthma before us, and even of humid asthma, occurring upon a SUDDEN DISAPPEARANCE OF scabid, herpetic, and other CUTANEOUS ERUPTIONS, are so common, that it is hardly worth while to dwell upon them. They are especially noticed by Sir John Floyer, and have rarely escaped the attention of any pathologist since his day. And that this is an actual cause of the disease, is perfectly manifest from the subsidence of the latter as soon as such eruption has been re-excited. A sudden disappearance of gout in the hand or foot, or of an habitual discharge, as that of the hemorrhoidal vessels, has operated in the same manner, while a renewal of these affections has proved an equal remedy.

But those of relaxed and PHLEGMATIC HABITS are peculiarly affected by such transfers of morbid action, particularly when the feet and ankles are habitually œdematous, and accustomed to enlarge towards night. Chronic or exacerbating dyspnœa is a frequent attendant upon such a state of corporeal debility; and hence we have reason to expect asthma also: for further information upon which subject the reader may turn to what has already been observed under *dyspnœa chronica*.

It is not surprising that asthma should be produced by the INHALED FUMES OF METALS, and other mineral substances, since we see it also frequently occasioned in constitutions prone to the complaint, by clouds of common smoke or dust. And Dr. Percival informs me that he has met with two cases in which slight apoplexies were concomitants of asthma, produced by concentrated fumes of nitrous acid; here again leading to the same train of causes we have already noticed, as laying a foundation for chronic dyspnœa.

To this subdivision, also, belong such cases of asthma as proceed from fogs and mists, especially those of populous and extensive towns, which many asthmatics are obliged to abandon, as soon as November makes its appearance, for a drier and less hazy atmosphere. The coats of the bronchiæ seem to be constringed by the inhaled vapour; and hence the suffocating feeling. Where, however, the internal tunic of the bronchiæ is habitually dry and irritable, the moisture of such an atmosphere cools and softens the harsh membrane, and the patient longs for such a situation, instead of flying from it. And hence the reason why fogs are poisonous to some asthmatics, and healthy to others. It is also probable that the altered gravity of the atmosphere, in these cases, and the larger and smaller doses of oxygen inhaled in every inspiration, produce some influence that proves beneficial or injurious, according to the habit or actual state of the air-vessels. And hence again, while some asthmatics can only live in a mountainous situation, others find their only relief in lowlands and valleys.

An impregnation of the atmosphere with odorous essences, has also been found in a few cases of uncommon idiosyncrasy, or where the air-vessels have been peculiarly sensible, a sufficient cause of the asthmatic paroxysm; which has hence been produced by the smell of musk, and in one instance, related by Timæus, by that of roses.—(*Cas.* 216.) And, in consequence, it is not to be wondered at, that more pungent, and perhaps acuated corpuscles should produce a like effect. Dr. Scott, of Northumberland, has given cases of the greatest danger and extremity, occasioned by accidentally inhaling the effluvia of ipecacuanha while pulverizing.—(*Edin. Med. Comment.*, vol. iv., p. 75.)

Another and a very frequent cause of both species of asthma, but more particularly the *asthma siccum*, is some organic derangement of the walls or contents of the chest. Gibbosity is one of the most common of the present group of causes. Lommius asserts, after Hippocrates (*Aph.* xlvi., sect. 6), that if a person become gibbous before puberty, in consequence of asthma, he dies.—(*Obs. Med.*, lib. ii., p. 146.) On which Dr. Bree has well observed, that the authors have here substituted cause for effect (*Inquiry*, &c., p. 24), since it is rather the gibbosity that produces the asthma, than the asthma that produces the gibbosity. An osseous, and consequently rigid condition of the cartilaginous extremities of the ribs and sternum; ossifications of the pericardium, the valves of the heart, or the coronary arteries; pressure upon the lungs produced by a dropsy of the chest, or of the pericardium; by an empyema; by vomicæ or indurated tumours of whatever kind in the substance of the lungs; an inordinate magnitude of the lungs themselves; have all been found occasional causes of asthma, and are among the most formidable to be attacked. Haller, Bonet, Morgagni, and others, who have been peculiarly attentive to structural diseases and their effects, have recorded numerous instances of this kind. And the later examinations of M. Rostan have added other morbid changes to those already noticed, in the heart indeed as well as in the lungs. In the first of these, he has very frequently found that particular kind of thickening of the left ventricle of the heart, to which the French have given the name of active aneurism: and, in the second, besides the morbid lesions already noticed, adhesions between the lungs and the pleura; effusions of serum into the cavity of the chest; and a general change of structure in the lungs, giving them a semblance of the organ of the liver. Several of these appearances are most probably effects of the disease, though by M. Rostan uniformly regarded as causes.

[It was strongly suspected by Laennec (Op. cit., p. 404), that in some rare instances of asthmatic dyspnœa, an imperfect paralysis of the diaphragm* and other muscles of inspiration

attacks them with such violence, that, unless a sufficient quantity of this narcotic be provided for them, they die in a few hours.—(Edinb. Med. and Surg. Journ.) This fact amounts to a convincing proof of the correctness of the term nervous asthma.—ED.

* When asthma is combined with some materia imperfection or disease of the organs of circula-

was concerned. Rostan gives an instance of asthma connected with ossification of the diaphragm.]

The general treatment of this distressing affection is still a matter of discussion. A considerable distinction is necessary in the two species under which it makes its appearance; and hence it will be more advantageous to defer the consideration of this subject, till we have noticed somewhat more at large the history of humid asthma, so that the plan proper for the one may stand in contrast with that proper for the other.

SPECIES II.

ASTHMA HUMIDUM.

HUMID ASTHMA. COMMON ASTHMA.

PAROXYSM GRADUAL; INGRAVESCENT, PROTRACTED; CONSTRICTION HEAVY, HUMID, LABORIOUS; COUGH SEVERE; EXPECTORATION COMMENCING EARLY; AT FIRST SCANTY AND VISCID, AFTERWARD COPIOUS, AND AFFORDING GREAT RELIEF.

This is the ordinary form under which the asthmatic paroxysm shows itself; and the trivial name of humid or humoral was given to it by earlier writers, most of them advocates of the humoral pathology, from an idea that an acrid humour was hereby discharged from the general mass of the blood, and consequently that the expuition was to be encouraged as much as possible; the suffocative struggle being regarded as an instinctive or remedial effort of nature to restore the system to a state of health.

Like the preceding species, it very generally appears without any obvious cause or connexion with any other affection. In some cases, however, it seems to be the result of a plethora, or, as Dr. Cullen expresses himself, a "turgescence of the blood, or any other cause of an unusual fulness and distention of the vessels of the lungs."—(*Pract. of Phys.*, part ii., book iii., chap. vi., sect. 1384.) And sometimes, as in old age, or after long-continued and repeated catarrhs, it is produced by an excess of serum or mucus flowing inordinately from a weakened and relaxed state of the bronchial exhalants or mucous glands: thus offering us three varieties as follow:

α Simplex. Simple humid asthma.	Without any manifest cause or combination with any other affection.
β Plethoricum. From plethora	From plethora, or the suppression of some accustomed sanguineous evacuation.
γ Atonicum. From local atony.	From a debilitated and relaxed condition of the excretories of the air-vessels, as a consequence of chronic and neglected catarrhs, or of old age.

We also meet with examples of the humid as well as of the dry asthma, as a symptom or sequel of many other diseases: as gout, hypochondrias, hysteria, parabysma, and syphilis.

I have already observed that the attack of the present species is more severe, as well as of longer duration than the preceding; as though the patient were contending with two hostile forces instead of with one—a diminished diameter of the vessels, and infarction from a surplus of viscid mucus: and thus both the exciting causes co-operate, which have been contended for singly by the leaders of opposite principles. I am much disposed to think that this is frequently the case; and that, to a certain extent, both hypotheses are correct. That asthma occurs as in the preceding species without any increased discharge of mucus, is unquestionable; that it occurs with such increased discharge, is equally incontrovertible.

But whatever be the source of the aggravated distress endured in humid asthma, after some hours of suffering the patient feels less anxiety, breathes more leisurely and with less labour, and, with a growing freedom of expectoration, acquires general relief and tranquillity. Yet such is the irritable state of the affected organs, that even on the second day "no change of posture is made with impunity, and particular distress affects him if he engage in the fatigue of dressing while the stomach is empty. During the day, if no particular hurry occur, the breathing becomes generally more free till the evening: an inexperienced asthmatic even flatters himself that his disease is leaving him; but he finds at the approach of night that he must sustain a new attack. The paroxysm recommences with the usual symptoms, and the night is passed nearly as the former; but the sleep is more perfect, and productive of more relief. The third day the remission is more complete, there is some additional expectoration, and bodily motion is performed with less distress, but still with great inconvenience. After the paroxysm has been renewed in this manner for three nights, the expectoration generally becomes free; but there is no certain termination of the fit at a fixed period. However, except in particular cases, it goes off after a few days; and as the daily remissions become more perfect, the urine is higher coloured, and in smaller quantities: the expectorated mucus is more copious and digested; strength of pulse and vigour of action increase; and good-humour again enlivens the mind."—(*Bree, Inquiry*, &c., sect. iv., p. 48.)

In TREATING asthma, our attention must be

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tion and respiration, it is often difficult to offer a positive opinion whether the latter circumstance is not consecutive, and gradually induced by the repeated attacks of the asthma. Then, we may also conceive that various morbid affections and organic diseases in asthma, are sometimes accidental attendants on it—not at all concerned with it either as a cause or an effect. Questions of this kind, as M. Jolly has well observed, are sometimes involved in difficulties which have not yet been obviated by pathological anatomy.—(Dict. de Méd. et de Chir. Pratiques, art. ASTHME.) No doubt, in a vast number of examples, in by far the greater number of cases, asthma is only a symptomatic disorder.—ED.

directed to the paroxysm itself, and to the nature of the constitution after the paroxysm has ceased; and even during the paroxysm, to the character of the particular species under which the disease shows itself.*

Dr. Cullen, who, as we have already seen, regarded plethora and turgescence of the blood-vessels as the usual cause, recommends blood-letting in the first attack, and especially in young persons; with the use of acids and neutral salts, as employed by Sir John Floyer, for the purpose of taking off the congestion of the blood. Nevertheless, bleeding demands a nice discrimination, and is rarely to be recommended in either species. The relief it affords, even in dry or convulsive asthma, is very temporary; and Dr. Cullen allows that it cannot be persevered in without undermining the constitution, and laying a foundation for dropsy.

Dr. Bree regards it as a doubtful operation in the first species, or that, to adopt his own language, produced by aerial irritation, and as always imprudent in the second. In this last, "I have repeatedly," says he, "directed it; but I have never had reason to think that the paroxysm was shortened an hour by the loss of blood: and I have often been convinced that the expectoration was delayed, and that more dyspnœa remained in the intermission, than was common after former paroxysms. In old people, who have been long used to the disorder, it is certainly injurious."†

Purging, beyond the intention of keeping the bowels regularly open, has seldom proved beneficial. When, indeed, the disease is secondary, and depends evidently upon an overloaded liver or stomach, or some suppressed evacuation, active cathartics, and especially such as operate simply, will be of great use: and the increased action excited in the alvine canal will often take off the irregular action in the chest; but where the asthma is idiopathic, and especially where the constitution is infirm, as in old age, a powerful alvine irritation will exacerbate the spasm of the chest, instead of diminishing it.

In exciting nausea or vomiting, however, we may be less cautious; for each has been found highly advantageous in both species of idiopathic asthma. The first, by diminishing generally the living power, and hereby relaxing the convulsive action; and the second, by changing the seat of the convulsive action, and at the same time determining to the surface. [This practice has the sanction of Riverius, Akenside, Sir John Floyer, and Laennec, who says, that it acts on the nervous system, and is often followed by an immediate alleviation of the paroxysm.*]

Blistering may also be made use of, but, like setons or issues, can only be of ulterior advantage, for the fit must be of far more than ordinary length if it continue till the blister has produced vesication. It may, however, go far to prevent or shorten a relapse on the ensuing night; and especially when the disease is connected with an asthmatic habit.

Sir John Floyer is said, during his residence at Lichfield, to have found great benefit in his own case by the use of very strong coffee. And the practice was afterward followed by Sir John Pringle, as he informs us, with equal success. "On reading the section on coffee, in the second volume of your Essays," says he, in a letter to Dr. Percival, "one quality occurred to me, which I had observed of that liquor, confirming what you had said of its sedative powers. It is the best abater of the periodic asthma that I have seen. The coffee ought to be of the best Mocha, newly burnt, and made very strong, immediately after grinding it. I have commonly ordered an ounce for one dish, which is to be repeated fresh after the interval of a quarter or half an hour, and which I direct to be taken without milk or sugar."

Sedatives and antispasmodics, given alone, have rarely been attended with any decisive advantage. They have occasionally afforded relief in the first species, but have had little effect in the second; and, by heating the system unnecessarily, have often augmented and prolonged the paroxysm. Dr. Bree, in relating his own case, which was that of humid asthma, tells us, that, in the access of a paroxysm, he took four grains of solid opium, which produced nearly an apoplectic stupor for two days. A few hours after trying the opium, a most debilitating sickness supervened, with incessant efforts to puke. The labour of the respiratory muscles abated, but the wheezing evidently increased, accompanied with an intense headache and a

* "The treatment of asthma, like that of all periodical diseases, consists of two parts; that proper in the paroxysm, and that in the interval."—(Forbes, in Cyclop. of Pract. Med., art. ASTHMA.) As the same physician justly observes, when the treatment of asthma is spoken of, that of its chronic forms is generally signified; for what is called acute asthma is either a variety of bronchitis, or a violent congestion of the pulmonary mucous membrane, both cases requiring to be treated on principles applicable to such pathological states, with little regard to the spasm which complicates it. These are truths to which all practitioners must subscribe.—ED.

† Inquiry, &c., p. 245. According to Dr. Forbes (Cyclop. of Pract. Med.), it never puts an end to the paroxysm, much less does it cure the disease; and its habitual employment, in an affection of frequent recurrence, cannot fail to be highly injurious. It is indicated in the early attacks of young and robust subjects; in cases of great general plethora; in fits of great violence, in which the pulmonary circulation is much impeded, and the brain, or other important organs, are likely to suffer in consequence.—ED.

* Laennec on Diseases of the Chest, &c., p. 418, 2d edit. Dr. Forbes approves of a dose of ipecacuanha when the paroxysm supervenes to a full meal, or occurs in a person having an habitually sluggish and loaded stomach; but he does not consider emetics generally useful. (Cyclop. of Pract. Med.) Akenside's practice consisted in giving ℈j. of ipecacuanha in the paroxysm to induce vomiting, which, he assures us, gave great relief; and, in the intervals, he gave gr. v. every morning, or gr. x. every alternate morning, these doses proving equally useful, whether they excited vomiting or merely nausea.—Med. Trans., vol. i.

countenance more turgid than usual; the pulse being at first strong and quick, and afterward sinking into great weakness. The paroxysm showed itself four hours earlier than usual the next day. He tried it in smaller doses during several subsequent fits, but in no instance without great general mischief, and with little or no local benefit.*

Much of this deleterious effect may have depended on idiosyncrasy. Sedatives and narcotics, if employed at all, should be combined with diaphoretics. In this form, they often prove a very powerful remedy: and one of the best preparations of this kind is the compound powder of ipecacuanha. A universal glow and diapnoë, as it has been called, or breathing moisture on the surface, are among the most favourable symptoms of the disease, under whatever form it makes its appearance. Antispasmodics and narcotics, as musk, castor, valerian, cardamine, camphire, and the fetid gums, may, perhaps, be employed successfully when the disease is chiefly dependant upon a morbid habit; but even here they will derive a great advantage from a union with diaphoretics, as the neutral salts, and small doses of ipecacuanha, or antimonial powder.

The hyoscyamus has often succeeded, as a narcotic, where opium has failed: but, like the latter, it should not be trusted to by itself in either species of the complaint.

[Laennec conceives, that narcotics may act, not merely by lessening the necessity of respiration, but also by overcoming the spasm of the lungs. The following, he says, have been particularly approved of: opium, belladonna, phellandrium aquaticum, aconitum, napellus, colchicum, tobacco smoked or taken internally, cicuta, dulcamara, hyoscyamus, and the smoking of stramonium. The cases in which he particularly recommends narcotics, are those seemingly attended with an extraordinary necessity for respiration, and a spasm of the lungs.

Besides narcotics, certain substances which act powerfully on the stomach, or nervous system, have been tried, as the distilled water of lauro-cerasus, the nux vomica, tincture of cantharides, the arsenical solution, and the prussic acid. Laennec found the laurel-cherry water and diluted prussic acid ease the breathing, though less certainly than narcotics. The same, he says, is true of the nitric, sulphuric, and acetic ethers.—(Op. cit., p. 416, 417.) With respect to the lobelia inflata, so much commended in America (*Eberle's Mat. Med., Philadel.*, 1822; *Dr. Andrew, Glasgow Journ.*, vol. i.), Dr. Forbes has found it temporarily successful in certain spurious cases, produced by hydrothorax and disease of the heart; and even in the catarrhal asthma, he has known it check the paroxysm, if given at the commencement of the attack; yet he estimates its claim to efficacy below that of stramonium.

Where the urine is small in quantity, and of a pale hue, and particularly where the disease is connected with a pituitous or phlegmatic habit, diuretics have been found serviceable. Dr. Ferriar combined them with opium.

But as there is no discharge that promises such direct benefit as that from the excretories of the bronchial vessels themselves, so is there no tribe of medicines on which we can place so much dependance as the expectorants, when judiciously selected and administered. In every kind of idiopathic asthma, these may be employed with advantage.

Among the fetid gums which have been employed for this purpose, ammoniac has acquired the greatest degree of popularity: but, its power is inferior to that of asafœtida, the virtue of which is to be judged of by the degree of its offensive odour. Both these, however, are apt to be too heating, except in very flaccid and phlegmatic habits; and it will hence be often necessary to soften their pungency by a saline medium, taking care not to irritate the bowels unduly. And where there is a considerable degree of irritability and much quickness of pulse, we may prefer several of the oleraceous, and especially the mucilaginous demulcents: but oily demulcents are always to be avoided.

Of all the medicines, however, which act on the excernents of the lungs, the squill is the most to be depended upon. It is indeed a stimulant of the excernent system generally; for there is no part of this system capable of resisting its power: and it is hence necessary to watch its effects upon the kidneys and intestinal canal, and to attemper it with opium or some other guard, if it produce much influence in either of these ways; except, indeed, in the case of asthma connected with the phlegmatic habit, which is the only modification of the disease in which this collateral influence is found to be of advantage. Squills have also a peculiar tendency to stimulate the stomach, and produce nausea or vomiting; and it rarely shows much of an expectorating power till it has occasioned the former. But as these are advantageous to the disease in both species, and especially in humid asthma, we are not to discontinue it on this account, but only to moderate its use. Many practitioners, indeed, employ it directly as an emetic medicine, and prefer it to ipecacuanha. In asthma it may, in some habits, be allowed to supersede it; but in no other disease that I recollect; for it is rougher in its action, and more offensive in its taste.

Where, however, the lungs seem to be affected only secondarily, and the source of the disease lies in an infarcted and torpid state of the liver or some other abdominal organ, squills, and indeed expectorants in general,

* Many cases of asthma being connected with a state of the bronchial membrane, analogous to inflammation, do not seem likely to admit of benefit from narcotics. Hence, Dr. Forbes is of opinion, that it is only in cases of pure nervous asthma, or in those symptomatic dyspnœas, simulating asthma, which depend on organic disease of the heart, &c., that opium and other narcotics and antispasmodics are at all likely to prove useful. In the hysteric asthma, the good effects of opium were long ago recognised by Willis.—See Cyclop. of Pract. Med., art. Asthma.—Ed.

will be found less serviceable, than in idiopathic cases. And hence we should prefer the seneka-root, which has often been found of great success, after calomel, or whatever other cathartic may be judged most proper, has been previously made use of. Seneka-root, indeed, is in itself a sort of general evacuant; for while it increases very largely the discharge of mucus, it increases also the flow of perspiration and urine, and sometimes acts as an emetic and purgative.

There is a tribe of medicines, which are also found of essential benefit in many cases of both species of asthma, but, with whose mode of action we are so little acquainted, that it has been explained on very different principles by different pathologists; I mean the acids, both mineral and vegetable. These principles we have not room to examine; nor is it necessary; since, if they be really beneficial, it is of little moment whether they act as sedatives in allaying irritation, or as tonics in invigorating the relaxed bronchial exhalants. The vegetable seem more efficacious than the mineral acids, probably because, in consequence of their being less corrosive, the patient can take them in larger quantity; and the vegetable acids obtained by fermentation, seem more useful than the native.

Yet these have rarely been given alone; for, by uniting them with diaphoretics, as small doses of ipecacuanha, or with narcotics, the remedial power of each has been augmented; and the latter are not only rendered more efficacious, but are borne with less mischief afterward. Sir John Floyer was in the habit of uniting the acetous acid with squills, and hence, indeed, the popularity which the vinegar of squills has preserved to the present day. Dr. Bree has employed both the vegetable and the mineral acids, but always in union with some other preparation. Thus in humid asthma, after emetics, he prescribes a draught composed of an ounce of distilled vinegar, and from one to three grains of ipecacuanha, in a sufficient quantity of pure water, to be taken every four hours, as a means of determining to the surface of the body, and of promoting absorption and exhalation. And as a means of taking off irritation and exciting the secernents of the bronchiæ, it may be also employed in nervous or dry asthma, and often with as good effect.

In like manner, Dr. Bree has made use of the nitric acid in union with squills and extract of henbane; giving three grains of the henbane with six minims of the acid and ten of tincture of squills in the form of a draught, and repeating it every three or four hours during the paroxysm. And he tells us that "Many patients, who had taken the most powerful antispasmodics, have assured me, that none had been so useful; and two gentlemen now under my direction inform me, that it is the only medicine that has ever given them relief in the paroxysms."—(*Inquiry*, &c., p. 285.) I cannot say that I have found it thus pre-eminently serviceable; but it has often been of decided benefit. And I know of no medicine that succeeds so well in preventing the mischievous effects of opium, and even in adding to its sedative power; or that is so valuable an adjunct in almost all antispasmodic preparations, and especially where ether, camphire, and other terebinthinates are employed; or that tends so effectually to take off all excess of pungency from the more heating expectorants.

As simple relaxants are always hurtful in this disease, and only add to the debility, it is not to be wondered at that warm bathing should be also injurious. Cold bathing, as a tonic between the intervals, has much more to be said in its favour. Dr. Bree tried it in his own person, but did not obtain success. His was a case of humid asthma. But in the first species, and particularly where habit has given inveteracy to the recurrence of the paroxysms, and where the general constitution is vigorous, there is no single remedy likely to be of more value.

[In Dr. Wilson Philip's "Inquiry into the Laws of the Vital Functions," will be found various observations, tending to prove the utility of galvanism in one form of asthma.]

Wherever asthma may be supposed to be dependant upon plethora, tonics can have no claim to be employed till after such a condition has been removed; and then, perhaps, the best medicine will be the mineral acids.

[When the asthmatic paroxysms have a strongly-marked periodical character, cinchona, according to Laennec, frequently diminishes their severity, and sometimes stops them altogether.]

Peruvian bark is often found to overload the stomach, especially in dyspeptic patients, with whom I have found columbo agree better, occasionally combined with carbonate of soda.* But the best tonics are the metallic oxydes, [and of these the subcarbonate of iron, given in doses from a scruple to a drachm, is praised by Dr. Bree and Laennec. The latter speaks particularly of its benefit in pallid relaxed habits, and both in the dry asthma and the nervous.—(*On Diseases of the Chest*, &c., p. 418.)]

Inhalations cannot well be tried during the paroxysms, but they have been very generally had recourse to in the intervals, and have consisted of very different vapours. When pneumatic medicine was at the height of its popularity, much benefit was supposed to be derived from the use of oxygen and hydrogen, and dilute chlorine gases. Dr. Beddoes was peculiarly attached to the former, and thus describes its effects with his constitutional warmth of expression;—"No sooner does it touch the lungs, than the livid colour of the countenance disappears, the laborious respiration ceases, and the functions of all the thoracic organs go on easily and pleasantly again." Yet, with all this high recommendation, few patients choose

* Dr. Forbes believes that bark possesses no specific powers in checking the return of the common asthmatic paroxysm; but, that it occasionally acts beneficially in two classes of cases; first, when the asthma is complicated with ague; and secondly, when the stomach or general system is in a state in which a tonic of this kind is beneficial.—Ed.

to be cured in this manner in the present day; oxygen gas is now rarely adverted to by asthmatics or their medical attendants; and the remedy, from having been extolled beyond its proper level, has fallen back into an unmerited disregard. Dr. Ferriar has spoken in more sober terms of the benefit of hydrogen in the first species; and I am induced to believe that a long perseverance in the use of this gas may often produce the effects he has ascribed to it; but it is rarely that I have seen it so decidedly useful as to ascribe the patient's recovery to this remedy, rather than to other means he had been employing at the same time.

Warm aromatic fumes have been also tried; as prophylactics, obtained from various substances. The smoking of tobacco has very extensively been recommended; the leaves of the *scandix odorata* were at one time in still higher repute; but both have of late years given way to those of the *datura stramonium*, or thorn-apple. Most of these contain a narcotic power, and whatever benefit they produce is hence, perhaps, chiefly derived; but either this narcotic power, or the stimulating power with which it is so intimately united, has at times been found to bring on a difficulty of swallowing.

Another process has lately been adopted in France, but of the issue of which we have not yet received any satisfactory information. It consists in a revival of the impregnated aqueous injections of Stephen Hales (*Hæmostatics*, ii., 74, 75), with a view of determining how far such impregnating materials may reach the lungs and be thrown off by the bronchial exhalants. Magendie (*Physiologie*, tom. ii., p. 291) and Nysten have been chiefly engaged in these researches, and they have ascertained that alcohol, ether, camphire, and most of the other volatile antispasmodics, together with the gases, are in this manner conveyed to the lungs, and transpire from the surface of their air-cells.

Issues, setons, and even cauteries, have been long in repute as useful drains or revellents; and under this character, are highly successful in the relief of asthma. And where the disease has appeared upon a sudden check of the cutaneous eruption, or a sudden cessation of any habitual evacuation, I can unite in this recommendation of Macbride (*Med. Observ. and Inq.*, vol. vi., art. ii.) and Reidlin.—(*Lin. Med.*, 1695, p. 91.) Issues to this end, and, indeed, for all others, are most conveniently kept open, and produce the most salutary irritations, by small pieces of the bark of spurge-laurel, or mezereon, both of which contain a very acrid matter; and the latter of which, more especially, has for this purpose been very generally employed in France, under the name of *écorce de Garou.*—(*Essai sur l'Usage et les Effets de l'Ecorce de Garou, par M. Archange le Noi, Paris*, 1767.) A lady, between fifty and sixty years of age, whom I have long been in the habit of attending, had several very severe fits of asthma, about three years ago, at the distance of ten days or a fortnight from each other. I discovered that she had been formerly subject, though at irregular periods, to slight bleedings from the hemorrhoidal vessels, which, for some months, had ceased to be renewed. With a view of exciting a vicarious action, I opened an issue in one of the arms, and irritated the rectum by small doses of aloetic cathartics. The issue discharged copiously for six weeks, during which time the patient continued free from all attack: I then suffered it to heal slowly, still continuing the aloes; and about a month afterward was informed, that the habitual discharge had returned. She had no paroxysm after this for upwards of two years.

Pontifex relates a case, in which a corpulent asthmatic patient, who suffered severely from frequent fits of this disease, was accidentally infected with the itch. As the eruption extended, his breathing became every day more easy; and, from the time that the contagion took place, he had no return of a paroxysm whatever. He was then desirous of being cured of the itch, and, for this purpose, went for several days successively into a cold bath. The eruption was hereby repelled; but he was immediately attacked with an asthmatic fit, which returned twice within the space of a month. M. Pontifex advised him to have recourse to his former cure, by using the bedclothes of one infected with the itch. This advice he followed; a few days after which the scabid eruption made its appearance, when he was again perfectly liberated from his asthma.*

The diet should be light and cordial, without being stimulant, and the food be of a solid, rather than of a liquid kind. All flatulent fruits and vegetables should be avoided; but oranges, the alliaceous esculents, and the aromata may be allowed in moderation. Hot liquors should be sedulously abstained from; and the beverage consist chiefly of coffee, ginger-tea, and acidolated waters.

Where asthma is dependant upon some primary affection of another kind, it can only be effectually treated by removing, or palliating, the original disorder.†

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* Recueil d'Obs. de Médecine des Hôpitaux Militaires, par M. Richard de Hautesierck, &c., tom. ii., 4to., Paris, 1774.

† The most recent pathological views of this disorder sustain the opinion that its dominant cause is often an emphysematous condition of the lungs. In regard to the treatment of this disease, regard must always be paid to the doctrines of plethora. Several American writers, as Thatcher, Eberle, and others, agree as to the value of the datura stramonium in lessening the violence of the paroxysms of asthma. Very lately, an ointment, made from veratria, has been used with great success against neuralgic irritation and spasmodic distress, and in controlling difficult respiration, accompanied with cough: clinical results may prove veratria to be efficacious in the treatment of asthma.—See Turnbull, on the External Application of Veratria. As asthma appears in paroxysms, much may be done in the way of preventing its attacks. For this purpose, cold bathing and cold affusions, and a strict attention to diet, will be found very beneficial. Finally, in many cases, where remedies are of little avail, a change of air and scene will often relieve the patient.—D.

GENUS V.
EPHIALTES.
INCUBUS.

SIGHING, SUFFOCATIVE ANHELATION, WITH INTERCEPTED UTTERANCE, AND A SENSE OF SOME EXTERNAL WEIGHT PRESSING HEAVILY ON THE CHEST; TRANSITORY.

EPHIALTES, incubus, nightmare, which are the common names in Greek, Latin, and English, for the present genus of diseases, though not exactly of the same meaning, import a sudden sense of an oppressive and suffocative weight on the chest, threatening strangulation, and rendering the person attacked incapable of changing his position. Ephialtes, from ἐφάλλομαι, signifies "to leap upon;" incubus, from incubo, "to lie upon;" and the term *mare*, in our compound nightmare, imbodies the looser idea contained in the Greek and Latin denominations, and signifies a hag, goblin, demon, or spectre; as though the oppressive weight were occasioned by some such hideous monster's abruptly leaping or lying on the chest; whence our old Anglo-Saxon name for the disease, *Elf-sidenne*, or elf-squatting; which is as significant as any of them.

The character of the genus will be found sufficiently expressed in the foregoing definition.

If the generic definition be correct, as I trust it is, there can be no doubt that ephialtes belongs to, or should be ranged in close connexion with, the family of anhelations, under which it was usually classed by the earlier writers; and, indeed, continued to be so till the time of Dr. Cullen, who has strangely removed it to that of *vesaniæ*, or mental derangements, putting it immediately after mania; reducing it from a generic to a specific station; and as singularly uniting it with *sleep-walking*, with which it has little or no connexion in cause or symptoms, as will be sufficiently obvious from comparing the account about to be given of the one disease with that of the other.

The history of the affection will easily lead us to the nature of its production. It appears most frequently in persons of an irritable or nervous temperament, and of a weakly constitution; particularly among those who are predisposed to hypochondrias or low spirits. Others, indeed, are occasionally affected by it, but more rarely, and perhaps in a less degree. It usually, though not always, occurs in the night, during a reclined position, and after great fatigue of body or mind, or a stomach disordered by indigestible food, or food taken in excess.

Although, therefore, the symptoms of this complaint are to be taken from the actual state of the muscles and other organs of respiration, the exciting cause is to be ascribed, for the most part, to the actual state of the stomach, or the sensorium, or both:—more generally, indeed, to both, as the brain and the stomach are so much in the habit of associating in the same action.

Yet how comes it that the organs of respiration should be thus singularly affected by the state of the stomach and the sensorium, and chiefly so in the night, rather than in the day? The solution of the question may be found in the reasons we have already offered, why the paroxysms of asthma, or of exacerbating dyspnœa, should mostly recur under similar circumstances, and at the same period.

Respiration is a semi-voluntary action. In firm health, the will, indeed, is seldom applied to for its aid: but the moment the moving powers of the chest labour under any degree of debility, the will instantly interferes, and by its stimulus compensates for the deficient energy.

Something like this applies to the state of the stomach, during the process of digestion. In healthful digestion, the ordinary action of the stomach is equal to its own demand: but the moment it labours under any degree of debility, or, in consequence of its being overloaded, or loaded with indigestible materials, its ordinary action is not sufficient, it becomes necessary that it should be supplied, not indeed by the will, but instinctively, or by the remedial aid of the living principle, with an additional flow of nervous energy to enable it to meet the excess of duty hereby imposed upon it.

The surplus of sensorial power, under such circumstances bestowed upon the stomach, is taken from the general supply to the system at large, as from a common stock; every organ contributing its proportion, and among others, the lungs. And if this demand, on the part of a feeble or overloaded stomach, should occur in a system, in which the general weakness of the respiratory organs is considerable; if it should take place in a recumbent position, in which they have, at all times, less power of action than in an upright posture; and if, moreover, it should be exhibited during sleep, in which the will itself, and most, sometimes indeed all, of the faculties of the mind are in a state of suspension, from a cause I shall hereafter have occasion to explain; almost every thing will co-operate to impede respiration, to lower the tone of the respiratory muscles, and consequently to excite in them irregular and spasmodic action; in one word, to lay a foundation for all the symptoms which characterize ephialtes: the mind, sympathetically disturbed and hurried in the midst of sleep, imaging to itself, at the moment, from the terrible sensation induced, as terrible a cause for its production, and giving full credulity to the presence of a huge and hideous spectre, tyrannically squatted upon the chest, and striving to take away the breath.

Now, in revery, the will, as indeed all the faculties of the mind, may be as abstracted during the day, as they are suspended in sleep during the night: and from the peculiar strength and vivacity of the train of ideas or mental emotions that constitute the revery, the same sudden exhaustion may take place, and the same inordinate demand upon the common stock of sensorial power, distributed throughout the system at large, may be made upon every organ acting under a common bond of sympathy, as we have just contemplated during the influence of sleep. And the respiratory organs being

thus, in the same manner, mulcted of a part of their ordinary influx of nervous power, the same complaint may take place in the one period as in the other; though, the body not being recumbent in the day, the lungs will not sustain so violent a struggle; and the intellect, from its being less passive than in sleep, not so strongly imposed upon. [Although the foregoing hypothesis, respecting the cause of incubus, displays much ingenuity, the editor need scarcely observe, that what is stated amounts to nothing more than conjecture, liable to the very same objections which have subverted most other theories on the subject. Were it true, hardly any dyspeptic person with weak lungs, who eats too freely, could ever escape an attack of nightmare after going to bed. Yet this is quite repugnant to common experience. The disorder has sometimes been imagined to proceed from a stagnation of the blood in the sinuses of the brain, or in the vessels of the lungs, or from too great a determination of blood to the head. The horizontal posture during sleep, and the pressure of the stomach upon the aorta in a supine position, have been fancied to be sufficient to produce an unusual distention of the vessels of the brain; while, by others, the weight of the heart pressing on the left auricle and large pulmonary veins, has been suspected to produce the oppression and sense of weight and suffocation in the breast.—(See *Bond, on Incubus*, 1753.) As Dr. Whytt has observed (*On Nervous Disorders*, chap. 6), however, if these opinions were true, every person that lies upon his back, especially after a full meal, ought to suffer a degree of nightmare. Dr. Bateman considered it probable, that the seat of nightmare was chiefly in the stomach. The sympathy of this organ with the head, heart, lungs, and diaphragm, he says, is so remarkable, that there can be no difficulty in referring the several symptoms of incubus to a disagreeable irritation of the nerves of the stomach. A heavy or flatulent supper undoubtedly aggravates the nightmare in persons predisposed to it. Persons are mostly attacked while lying upon their back, because in this position the viscera make greater pressure on the diaphragm, and inspiration is less easy. The nightmare takes place only in sleep, because the strange ideas excited in the mind, in consequence of the disordered feelings of the stomach, are not then corrected by the external senses; nor do we then, by an increased respiration, or other motions of the body, endeavour to shake off any beginning uneasiness about the stomach or breast. The nightmare generally occurs in the first sleep, and seldom towards the morning, because at the earlier period the stomach is more loaded with food, and digestion is less advanced. It may be remarked, however, that neither a horizontal posture, sleep, nor heavy suppers ever produce the nightmare, at least, in any considerable degree, unless the person be already predisposed to the complaint by the particular condition of the nerves of the stomach. As far as practical considerations are concerned, there may not be any very important difference between our author's views and those of Drs. Whytt and Bateman, since he represents the imposition of too much work on the stomach as the exciting cause. And it is only in his *rationale*, that he lets his imagination take a random flight. With respect to his hypothesis of the cause of the daymare, it may be noticed, that the case which he has inserted as an illustration of it, could not be connected with revery or abstraction of the mind, as it always took place *suddenly*, and at *regular periods*. Be this as it may, our author describes the two following species of the affection:]

1. Ephialtes Vigilantium. Daymare.
2. ——— Nocturnus. Nightmare

SPECIES I.
EPHIALTES VIGILANTIUM.
DAYMARE.

PRODUCED DURING WAKEFULNESS; THE PRESSURE SEVERE, AND EXTENDING OVER THE ABDOMEN; RESPIRATION FREQUENT, LABORIOUS, CONSTRICTED; EYES FIXED; SIGHING DEEP AND VIOLENT; INTELLECT UNDISTURBED.

This species is less frequently described by pathological writers than the ephialtes of the night season. Rhodius (Cent. i., observ. 54.) however, Forestus (Lib. x., obs. 52), and Sauvages (Class v., ord. i., *Anhelationes Spasmodicæ*, gen. i.), have distinctly marked it; and a striking example of it occurred some years ago in my own practice.

Forestus gives a case that returned periodically every third day, like an intermittent fever. The patient was a girl nine years of age, and, at these times, was suddenly attacked with great terror, a constriction of both the upper and lower belly, with urgent difficulty of breathing. Her eyes continued open, and were permanently turned to one spot; with her hands she forcibly grasped hold of things, that she might breathe the more easily. When spoken to, she returned no answer. In the meantime, the mind seemed to be collected; she was without sleep; sighed repeatedly; the abdomen was elevated, the thorax still violently constricted, and oppressed with laborious respiration and heavy panting; she was incapable of utterance.

This case seems to be founded upon a highly irritable or spastic diathesis, and makes some approach towards ecstasis and catalepsy; but, with that intolerable weight on the chest which peculiarly marks ephialtes. No exciting cause is stated. A predisposing cause I have already hinted at, and shall briefly advert to the treatment under the ensuing species.

SPECIES II.
EPHIALTES NOCTURNUS.
NIGHTMARE.

PRODUCED DURING SLEEP, AND INTERRUPTING IT WITH VIOLENT STRUGGLE AND TREMOR: THE PRESSURE ON THE CHEST SEEMING TO

BE THAT OF SOME HIDEOUS MONSTER, OR PHANTOM.

THE sensation is said to be frequently preceded by some fearful dream, as that of an implacable enemy, known or unknown, in close pursuit of the dreamer, from whose grasp he feels incapable of escaping; or of exposure to some overwhelming danger by sea or land, as that of falling from a steep precipice; or struggling, amid the ruins of a shipwreck, with rocks and breakers that threaten to dash him to pieces every moment. This I believe is often the case; and particularly when the state of the brain, rather than that of the stomach, forms the exciting cause.

The attack, however, appears to be sometimes slighter, and unaccompanied with such fearful scenes of desperate adventure, or the machinery of hideous and appalling demons or monsters; for Fortis gives the case of a young woman, who, during the paroxysm, supposed herself to be pressed upon by a man who was very far from being disagreeable to her; yet awoke from this imaginary concubinage with the usual sense of oppression, the voice and breath interrupted, great anxiety, and the face covered with sweat.—(*Sauv. Nosol.*, Meth. i., 631.) And similar cases, according to Craanen, Heurnius, and Forestus, have occurred to men as well as to women. While we are told by Pliny, that the oppression, in his day, was ascribed to the sports of fauns, an idea rather pleasing than hateful to the imagination; and that the disease was hence denominated faungambols, *ludibria fauni*.

The treatment may be stated in a few words. The mind and body should be kept free from all undue fatigue and commotion, and the diet be light, especially towards the evening. The action of the bowels should be kept regular; and, perhaps, as Dr. Darwin recommends, a mattress or harder bed than usual should be used, and an alarum clock hung up in the room, so that the sleep may be interrupted at short intervals. [The patient should sleep with his head raised on high pillows, and lie on his side. If the functions of the stomach be much disordered, the directions already given for the relief of dyspepsy and other affections of this organ should be followed.] These plans will supersede the use of the feeble medicines which were formerly in vogue for the cure of nightmare, as saffron and peony, and will render superfluous all further inquiry into a subject which once exercised the pen of the learned, whether the latter was or was not a specific in the form of an amulet.

GENUS VI.

STERNALGIA.

SUFFOCATIVE BREAST-PANG.

VIOLENT PAIN ABOUT THE STERNUM, EXTENDING TOWARDS THE ARMS; ANXIETY, DIFFICULTY OF BREATHING, AND SENSE OF SUFFOCATION.

THIS disease is described by modern writers under the names of *angina pectoris*, *syncope anginosa*, *asthma dolorificum* or *arthriticum*, *orthopnœa cardiaca*, and various others of a similar import, that clearly discover its relationship to the genera which have just passed in review before us. It has characters, however, sufficiently marked to separate it from all of them, and particularly from those under which it has hitherto been ranked as a species or subdivision. And I have, in consequence, been under the necessity of giving it a new denomination, as well as of assigning it a new place: and hence the above name of STERNALGIA (ΣΤΕΡΝΑΛΓΙΑ); a compound importing "pain about the sternum," which is a striking pathognomonic symptom, if not the leading feature of the affection. It is here it differs essentially from syncope and asthma, neither of which terms, therefore, ought to have been appropriated to it; while it has still less connexion with angina, in its common sense of quinsy, although this is the name by which, from the time of Dr. Heberden, it has been most frequently denominated.

M. Brera, an Italian physician of deserved eminence, but whose work (*Della Sternocardia*, Verona, 1810) the author was unacquainted with till after the first edition of the present, has entitled it *sternocardia*, and M. Portal has preferred this term to *angina pectoris*. Its chief objection is a derivation from two distinct organs, as the seat of disease.

The genus offers us two species:—

1. Sternalgia Ambulantium. Acute Breast-pang.
2. ——— Chronica. Chronic Breast-pang.

SPECIES I.

STERNALGIA AMBULANTIUM

ACUTE BREAST-PANG.

SUPERVENING SUDDENLY DURING EXERCISE, WITH TENDENCY TO SYNCOPE: RELIEVED BY REST.

IT is singular that there is no description which will fairly apply to this genus under either of its species, in any of the writings of the Greek, Roman, or Arabian authors that have descended to us. Some few passages have been quoted as possibly referring to it; but, on examination, they will be found too general for the purpose, or evidently intended for some other affection. Such particularly is the *asthma pneumodes* of Aretæus, referred to by Swediaur, who has distinguished the disease in his Nosology by the name of *pnigophobia*. And hence, considering the minuteness with which many of the writers thus adverted to have followed up all the morbid affections of the human frame, and the accuracy with which they have described them, the most reasonable conclusion is, that, like rickets and several other diseases, it was not known to them, or, in other words, was not in existence.

The first glances at it which we are anywhere capable of tracing, are to be met with occasionally in the works of Morgagni (see especially *Epist.* xxiii., art. 8, 9), and somewhat

more distinctly in the *Consultationes Medicæ* of Hoffmann. Dr. Letherland has followed up the inquiry with a curious spirit of research in the Edinburgh Medical Commentaries (vol. iii., p. 180), and has quoted a passage from the works of Poter, which renders it highly probable that this writer was well acquainted with, at least, the first species of the genus, and was aware of its being often fatal. Poter's description of the disease is as follows:—"Respirandi difficultas quæ per intervalla deambulantibus incidit; sic ut plurimum derepentè moriuntur."—(*Poterii Op.*, Cent. 3, No. 22.) But it is to the late Dr. Heberden that we are indebted for the first full and perspicuous account of sternalgia, or, as he calls it, *angina pectoris*.—(See *Med. Trans.*, vols. ii. and iii.)

Dr. Cullen has not noticed the complaint, either in his Nosology or in his First Lines; but he has entered it with the unsatisfactory name of *angina pectoris* in his "Catalogue of Omitted Diseases."

It has, however, been minutely described and well illustrated, both historically and practically, by many modern writers of established reputation, as Dr. Fothergill, Dr. Duncan, Dr. Percival, Dr. Darwin, Dr. Macbride, Dr. Hamilton, Dr. Haygarth, and Dr. Parry, most of whom have accompanied their descriptions with a speculative inquiry into the causes of the complaint.

Sternalgia rarely attacks the young, or those who are under five-and-forty or fifty years of age. Persons with short necks, inclined to corpulence, or of a gouty temperament, and especially when indulging a sedative life, are peculiarly predisposed to it. The form it first assumes is commonly that of the present species, by far the most severe, and, as Poter correctly observes, the most frequently fatal: for when the constitution has been for some time habituated to the paroxysms, though it often becomes greatly debilitated by them, and the paroxysms themselves increase in duration, it passes through the attack with less violence and immediate danger.

The incipient assault is usually felt while the patient is walking, and especially if he happen to be walking soon after eating, or during the process of digestion. He complains of a new and painful sensation in his breast, spreading up to his arms. At first, perhaps, this extends no farther than to the insertion of the deltoid muscle, and more commonly on the left side than on the right; but it soon winds its way to the elbow, wrist, and fingers' ends. In this incipient state, he sometimes loses the pain suddenly and entirely by merely standing still. Yet it rarely continues more than from half an hour to an hour, even under its most severe assault, and where it proves fatal. There is sometimes connected with it a strong feeling of flatulence at the stomach, with momentary ease on eructation. The face, moreover, is often pale, and the body bathed in perspiration.

Whatever exercise the person is engaged in when the paroxysm attacks him, he feels that a perseverance in it would produce a total suspension of living power; and hence, if he be walking, and especially against the wind, he turns from the wind and stands still; when, if the complaint be slight, and in its infancy, it soon vanishes.

In one instance, a patient thus attacked, and who was distinguished for great firmness of mind, had the resolution to continue walking, and found the pain go off after it had affected him from five to ten minutes.—(*Parry, Treatise on Angina Pectoris.*) If, by a like degree of courageous effort, the patient, in struggling for breath, be able to overcome the constriction, he will continue able through the remainder of the fit to make a deep inspiration, though accompanied perhaps with sighing and some difficulty of expiring his breath. In other instances, however, an equal degree of firmness has been exerted in vain. In most cases, the pulse, during this contest, varies but little, yet it is sometimes quickened, and sometimes intermits; while, in a few instances, the heart palpitates considerably, though less so than in the chronic species.

A habit of return is soon induced after a few fits have paved the way; and when this is effected, the action of walking is not necessary for its production, for it will sometimes be brought on by the most trivial circumstances, as coughing, swallowing, going to stool, or a slight disturbance of the mind. And, in this case, the first species becomes converted into the second. "One," says Dr. Heberden (*Med. Trans.*, vol. ii., p. 61), "has told me that this complaint was greatest in winter; another, that it was aggravated by warm weather; in the rest, the seasons were not suspected of making any difference." The pulse is not only little affected, as already observed, during the paroxysm, but even in the intervals; being, for the most part, only a little quickened, and seldom exceeding eighty strokes in a minute; in one instance, even where the semilunar valves of the heart were afterward found ossified, and the ossification had extended to the aorta itself, the pulse, though small, never exhibited irregularity.—(*Med. Trans.*, vol. iii., p. 16.) Yet, in a few instances, I have found it not only irregular, but intermittent; and intermittent for some weeks after the paroxysm had ceased to return. In others, it has been strong and vibratory.

The cause is very obscure, and the more so as the disease has often been found in persons labouring under different sorts of structural derangement about the heart, or in one or more of the organs of respiration, to which it has been ascribed, as soon as such derangements have been discovered; while, in other cases, nothing of the kind seems to have existed. Thus, the cartilaginous portions of the ribs have sometimes appeared ossified on examination after death; sometimes the semilunar valves of the heart; and sometimes the coronary arteries: and hence Dr. Wall (*Med. Trans.*, vol. iii., art. ii.) has ascribed the disease to the first or second of these morbid changes, and Drs. Heberden and Parry to the third (*Treatise on the Syncope Anginosa*, commonly called Angina Pectoris), who have been followed by Burns

and Kreysig. Dr. Cuming found the heart itself double its natural size, with some kind of morbid change in several of the surrounding organs.—(*Case of Diseased Heart, &c., Dublin Reports*, vol. iii.) Dr. Haygarth, on one occasion, found the mediastinum in a state of suppurative inflammation, and has hence regarded this as the cause (*Med. Trans.*, vol. iii., art. vi.); while, as the pericardium has sometimes evinced concretions of blood, Dr. Hooper and others have referred the disease to this affection.—(*Mem. of the Med. Soc. of Lond.*, vol. i., p. 19, 21.) Dr. Hosack conceives (*Americ. Med. and Phil. Regist.*, vol. ii., p. 366), "that it most frequently arises from a plethoric state of the bloodvessels, more especially from a disproportionate accumulation of blood in the heart and large vessels;" an opinion more in accordance with the observation of Dr. John Forbes than any of the others.—(See *note in transl. of Laennec on Diseases of the Chest*, 2d edit., p. 692.) Dr. Darwin mentions it as a sort of asthma, producing a cramp of a peculiar kind in the diaphragm, or the other muscles of respiration; while a very large number of pathologists, among whom may be mentioned Elsner (*Abhandlung über die Brustbräune*, Königsburg), Benger (*Algem. Deutsche Bibl.*, xxxvi., p. 125), Dr. Butter (*Treatise on the Disease commonly called Angina Pectoris*, London, 1791), and Dr. Macqueen (*London Medical Journal*, vol. v.), have endeavoured to account for it as a particular species of gout: and hence Dr. Berger attacked it with gum guaiacum, which, in his paper upon this subject in the Copenhagen Transactions, he asserts to have been particularly serviceable. Dr. Latham has, in various instances, found it in persons who, possessed of sound chests and apparently untainted constitutions (*Med. Trans.*, vol. iv., art. xvi.), were affected with enlargements of the abdominal viscera, or other diseases seated in these organs.*

That there is a violent and painful constriction of some of the muscles about the sternum during the existence of the paroxysm, and that respiration is hence greatly impeded, is unquestionable; and that many of the above misformations of structure, or constitutional habits, may occasion a predisposition to sternalgia, is highly probable; but they give us little or no information concerning the cause that immediately produces it; while it is by no means unlikely, that several of these morbid changes, thus brought forward as causes, are themselves only effects of so laborious and perilous a struggle. And hence we cannot, I am afraid, in our present defective knowledge of the physiology of the disease, do more than adopt the modest opinion of Dr. Bergius and Dr. Heberden, and regard it as dependant upon a cause that has not yet been traced out, but which does not seem to originate necessarily in any structural derangement of the organs affected.

The variable state of the pulse, and the occasional palpitation of the heart, are best accounted for by supposing some such structural disease as we have just seen occasionally exists there. Yet even these symptoms may depend upon the habit or idiosyncrasy, and appear to have occurred, in a few instances, in which dissection has discovered no such manifest local cause. So far as I have witnessed the disease, it has commenced in the respiratory muscles with a suffocative struggle, and tense constrictive pain: and it has not been till a minute or two afterward, and where the spastic action has extended in different directions, that the pulse has varied, or palpitation ensued: as though the primary seat of disease was in these muscles, and the heart was only affected secondarily.

[Laennec considers *angina pectoris* as a variety of neuralgia of the heart. The doctrine of the disease being always the effect of some organic affection of this viscus, he says, is far from being correct. He has known many individuals, who suffered a few very severe but short attacks of it, and then had no further return of it. On the other hand, he admits, that it frequently accompanies organic diseases of the heart. He has examined several subjects, whose cases were attended either with hypertrophy, or dilatation of the heart; but in none of these instances were the coronary arteries ossified. Andral relates a case, in which, after death, no appreciable morbid change was detected in the heart, but there were tubercles in the lungs. He takes the opportunity to observe, that the suspicion of angina pectoris being dependant upon an ossified state of the coronary arteries, is destitute of proof; and the disorder is set down by him as an impairment of, what he calls, the *innervation* of the heart.—(*Andral, Précis d'Anat. Pathol.*, tom. ii., p. 345.) Laennec conceives (Op. cit., p. 690), that the site of the disorder may vary. When there is pain both in the heart and lungs, the affection may be chiefly situated in the pneumogastric nerve; when there is merely a sense of stricture in the heart, the disorder may be in the nervous filaments, which the heart receives from the great sympathetic nerve. Other nerves are also simultaneously affected by sympathy, or direct anastomosis.]

When the real nature of the disease is thus doubtful, and its causes thus obscure or variable, its best mode of treatment must be equally uncertain; and though I willingly join with Dr. Heberden in thinking, that we ought not to

* Dr. John Warren, of Boston, states (New-England Journal, vol. i., p. 11) that angina pectoris may probably be the effect of an incapacity of the heart to empty itself of blood (forced into it in an accelerated circulation) sufficiently fast to maintain the vital functions. Prof. Chapman, of Philadelphia, remarks, "that the disease is a species of neuralgia, we are entirely persuaded, commencing, for the most part, in the pneumogastric nerve, and spreading in different directions as other nerves may become involved. That it is, in many instances at least, derived from irregular gout, which, misplaced thus, operates as an irritant to the nerves, and probably first to those of the stomach, seems highly probable."—See Hays' Cycloped. of Pract. Med. and Surgery, Art. Angina Pectoris.—D.

despair of finding a cure, I am afraid we have not yet found it.

Where the temperament is plethoric, or the heart is evidently implicated in the affection, bleeding will often afford some relief. But, in the simplest cases of the complaint, where the pulse is little disturbed, and the heart without palpitation, the use of the lancet has proved injurious, rather than beneficial; and purging has been of as little avail. Antispasmodics and cordials, and especially wine, palliate the symptoms for a few minutes, but afterward lose their virtue.

The mode of treatment which I have found most successful consists in putting the patient immediately in an inclined, rather than a recumbent position, with his head raised high. He should instantly take an emetic of whatever may be given most expeditiously, though the antimonial preparations form the best medicine for this purpose, as producing a longer action. As soon as the patient rejects, he may be allowed a little warm water, administered to him sparingly. The diaphoresis, hereby induced, should be assisted by a moderate warmth of bedclothes, and particularly by placing the patient between blankets; and, if the constrictive pain or difficulty of respiration still outlast the sickness, opium, intermixed with ether, camphire, or other diffusible antispasmodics, should be employed pretty freely. And I may here observe, as a general rule, that, where the common forms of opium, as the extract, wine, or tincture, are found to affect the head, the Lancashire or Cheshire preparation of it, known by the name of *black drop*, which is a solution of this drug, in verjuice, with, apparently, some portion of rectified spirit, and, certainly, a liberal combination of aromatics, seems to have less tendency to excite nausea and headache afterward: and, from its being nearly double the strength of the ordinary laudanum, may be used in a much smaller quantity. Mr. Batley's well-known form will also, in many cases, succeed as well.*

But it is in the intervals of the fits that medical skill and ingenuity are likely to be most efficacious. If we find the complaint connected, as it often is, with a morbid diathesis of any kind, as that of gout, with the sudden suppression of any habitual discharge, as that of the hemorrhoidal vessels, or a chronic affection of any other organ, as the heart, the stomach, or the liver, our attention must be immediately directed to what may thus prove a predisposing cause, which we must endeavour to palliate or remove, according to the nature of the cause we may be fortunate enough to detect. The bowels, in the meantime, must be kept gently open, and a freedom from relapse be secured at night for a week or a fortnight by an opiate pill, or the extract of henbane.

As the disease is greatly dependant upon a morbid mobility and weakness of the muscular fibres, either general or local, a tonic course of medicine and regimen should be instantly commenced, and unswervingly persevered in. The diet should be light; all flatulent foods and drinks be cautiously avoided; the hours be early, and the exercise indulged in be of the gentlest kind.

Arsenic, in small doses, is said to have been tried with advantage (*Alexander, Med. Comm.*, Edinb., vol. v., p. 99); but I know nothing of its effects from my own practice; and should prefer the oxydes of many other metals, and particularly those of bismuth, copper, and iron, as more likely to afford a permanent and radical cure. Sir Gilbert Blane has briefly noted a case, in which the disease yielded to arsenic in combination with digitalis and mercury.—(*Medico-Chir. Trans.*, vol. iv. p. 136.)

Where the complaint is strictly idiopathic and uncombined, it has often been found to give way to some local irritation or vicarious drain. A sudden flow of blood from the anus has completely removed it. An ichorous or serous discharge from the same organ has proved equally successful; as has also an obstinate gleet. And it is hence not to be wondered at, that setons or issues should have been productive of equal service. The latter are to be preferred as the least troublesome; one should be opened in each thigh, and each incision should be large enough to contain two peas; which it would be better at first to make of the mezereon bark, as already recommended for the same purpose in asthma.

[The prussic or hydrocyanic acid, prepared according to Scheele's formula, and given during the paroxysm, has sometimes proved rapidly successful; and this, probably, from its power of augmenting action, while it diminishes irritability.

Laennec has a high opinion of the usefulness of magnetism, with leeches, blisters to the forepart of the chest, the cherry-laurel infusion, digitalis, or the fetid gums; a mild regimen, and the warm or cold bath, according to the season of the year.]

SPECIES II.

STERNALGIA CHRONICA.

CHRONIC BREAST-PANG.

THE PAROXYSMS LESS VIOLENT, BUT OF LONGER CONTINUANCE; RECURRING FREQUENTLY WITH GREAT PALPITATION OF THE HEART, EXCITED BY SLIGHT AND OFTEN UNKNOWN CAUSES, AND NOT RELIEVED BY REST.

From the observations which have been thrown out at some length in treating of ephialtes and asthma, it is not to be wondered at that sternalgia should in many habits, where it has once taken a hold, be peculiarly disposed to recur when the body is recumbent, and particularly during sleep: nor even that, in some idiosyncrasies, it should, like the two complaints just alluded to, often originate in such a state of body.

If, however, the first attacks do not prove fatal, the disease is often apt to become chronic,

* At the present time we should commonly prefer the acetate or muriate of morphia; preparations of opium freed from narcotine.—Ed.

and to exhibit the symptoms that characterize the present species. The attack is now not only more easily brought on, but requires a longer period of time for its removal. Rest, even if it commence during exercise, has little or no effect, and the paroxysm has at times been protracted not only for some hours, but even for several days, without remission, and occasionally with a considerable degree of danger through the whole period. Yet it has occasionally continued to harass and weaken the constitution, without actually destroying it, for twenty years; and in a few instances, has been known to cease spontaneously. In this species of the disease, we meet with far more instances of palpitation of the heart and irregular pulse than in the preceding: and not unfrequently these catenating symptoms become more manifest and distressing as the disease becomes more inveterate; as though the morbid state of the heart or its appendages were a result of sternalgia, instead of sternalgia being a result of the former. In Sir Gilbert Blane's valuable Table of Medical Cases occurring in his private practice, as contradistinguished from the diary of his public duty as physician to St. Thomas's Hospital, under the head of "Palpitation of the Heart and Angina Pectoris," we have the following remark:—"In one of these cases, there was an extreme distress of breathing for five years, and the pulse fluctuated from 20 to 32, never falling below the former, nor exceeding the latter. Nothing gave material relief. Leave was not obtained to open the body after death."* Dr. Fothergill, in like manner, asserts, not only that the pulse, in his practice, has been irregular and intermitting during the exacerbations, but that it has continued irregular, and even intermittent, when the patient has been free from pain and at rest.

Of the medical treatment and regimen, I have already spoken under the preceding species.

GENUS VII.

PLEURALGIA.

PAIN IN THE SIDE.

PUNGENT PAIN IN THE SIDE; DIFFICULTY OF BREATHING; WITHOUT FEVER OR INFLAMMATION.

THE last genus of diseases which occurs under the present order, is that which has been usually denominated pleurodyne, for which pleuralgia is here adopted in its stead for the sake of simplicity. Both terms import pain or ache in the side; but as *algia* is a more common medical termination than *odyne*, and one alone is sufficient, a preference has been given to the former. On a nice and critical examination, it would not be difficult to point out a shade of difference between ἄλγος and ὀδύνη, but no such critical distinction has been ever attended to by professional writers, and, as terminations to medical compounds, they are used convertibly, or as direct synonymes.—(See *the Author's Prelim. Dissert. to his Nosology*, p. 59.)

The difficulty of breathing, noticed in the generic definition, depends altogether upon the acute ache produced by every attempt to inflate the lungs; and though negative characters ought to be avoided as much as possible, both in generic and specific definitions, it is necessary in the present instance to add, "without fever or inflammation;" since this is the chief feature by which pleuralgia, or "stich in the pleura" is distinguished from "pleuritis, or inflammation of the pleura."

Pleuralgia, or pleurodyne, is no more to be found in Dr. Cullen's Nosology than sternalgia. Pain in the side is, in his opinion, never any thing more than a mere symptom of some other complaint, most commonly rheumatism; and the example which Dr. Cullen has thus set has been followed by most of the later writers of our own country. There are two species, however, that have a fair claim to be regarded as strictly idiopathic. They do not often, indeed, constitute alarming diseases, but so long as they continue, are peculiarly distressing; while the latter is often of long duration, and demands a considerable range of medical treatment.

Sauvages, therefore, is fully justified in forming a distinct genus of the complaints before us; and Macbride is more to be commended in following his example than Cullen in departing from it. The two species are as follow:—

1. Pleuralgia Acuta. Stitch.
2. ——— Chronica. Chronic pain in the side

SPECIES I.

PLEURALGIA ACUTA.

STITCH.

PAIN SUDDEN AND TEMPORARY; SUPERVENING ON MUSCULAR EXERCISE; RELIEVED BY PRESSURE.

THIS species is found most frequent among

* Med.-Chir. Trans., vol. iv., p. 136. The late Mr. Robert Bligh, who was attended by Dr. Pinckard and the editor, was attacked in bed nearly every night, for some months previous to his death, with such pain about the heart, palpitations, and difficulty of respiration, that he was always obliged to get up immediately, and walk about, to prevent suffocation. His pulse was generally between 28 and 36, regular and strong, but with a vibratory motion in it. One afternoon he fell down dead. The editor examined his body, assisted by Mr. Hooper, of the London Road. The auriculo-ventricular opening of the left side of the heart, and the mitral valves, were much thickened. The lungs were healthy, with the exception of some adhesions to the inside of the chest. In the right bag of the pleura, about a pint of bloody serum was discovered. The liver was prodigiously enlarged, hardened, and of a dark purple ink colour. In the gall-bladder there were about twenty calculi; and, in the left kidney, a good deal of gravel. Experience certainly does not at present justify the inference, that angina pectoris is a distinct disorder, depending upon any determinate series of morbid appearances; though, in opposition to the conclusion of Laennec and Andral, it may be safely asserted, that it is undoubtedly, in many instances, not simply a functional disorder of the nerves of the heart, but actually connected with organic disease, as exemplified by dissections.—ED.

boys, who are engaged in any violent exertion, and particularly in hard running. It is produced by too great and sudden a distention of the fine bloodvessels of the pleura, from undue propulsion of the blood.

It is relieved by a handkerchief, or any other tight bandage. It gradually subsides on rest, or even slackening the pace. When this is not the case, bleeding and other evacuants are instantly necessary; together with warm relaxing liniments, and anodyne fomentations.

It is from this forcible distention of the minute vessels of the pleura that Van Swieten, Sauvages, and Macbride distinguish this species by the name of pleurodyne à spasmate; thus making a distinction between spasma and spasmus; and understanding by the former, that voluntary stretching or straining which takes place in any vehement exertion, contraction, or extension of a muscle, as in striving, bearing heavy burdens, or running. In the language of M. de Sauvages (*Nosol. Method.*, Cl. v., Ord. ii., Gen. xi), "Spasma non est spasmus, sed distractio, divulsio, qualis accidere solet à vehementi musculi nisû, contractione, extensione; ut inter luctandum, onera gestanda, currendum."

This species is occasionally met with as a symptom in flatulence, hysteria, and hypochondrias: in all these cases, however, though the disease or symptoms are the same, the exciting cause is very different. There is here evidently a nervous or irritable temperament, and a tendency to spastic action.

[With regard to the hypothesis of stitch depending upon an immoderate propulsion of the blood into the vessels of the pleura, it seems to be unsupported by any kind of evidence; nor is the editor aware that mere distention of bloodvessels will in any other instance satisfactorily account for an attack of acute pain. The stitch, which is so common to young persons in their active sports, is generally a pain fixed nearly to a point either within one of the hypochondria, or under the false ribs, and is too circumscribed to admit of being explained by the supposed immoderate distention of the bloodvessels of the pleura, even if such distention could account for the sudden pain.]

SPECIES II.

PLEURALGIA CHRONICA.

CHRONIC PAIN IN THE SIDE.

PAIN PERMANENT: AUGMENTED BY PRESSURE: INABILITY OF LYING ON THE SIDE AFFECTED.

This species is more diffused than the first, and accompanied with a considerable degree of irritation; whence pressure, instead of diminishing, augments the pain. The cause is therefore of a different kind from any of those already noticed, and is perhaps most frequently to be found in adhesions of the folds of the pleura to each other, or to the intercostal muscles, or a thickening in some part of its extent, whereby the play of the respiratory organs is impeded, and a state of perpetual irritation, or a ceaseless tendency to irritation, is kept up.

This species has also often been produced by a fractured rib, or some other lesion of the chest; or by some internal malformation, or other structural disease in the organs of the same cavity. Dr. Percival, in a note upon this species, appended to the volume of Nosology, refers to a case which once occurred to him, of pain in the left side, acute and obstinate, that baffled all remedies, local and general; and which was at length found to have originated from an aneurism of the aorta.

Chronic pleuralgia may also follow from an inflammation of the pleura; or from transferred gout or rheumatism. It is peculiarly apt to take place under every disease, which, by lowering the tone of the system, renders it generally irritable and subject to irregularity of action; as is the case in worms, syphilis, and phthisis. The opposite extreme of plethora has, moreover, not unfrequently been found to produce it.

Most of these, however, may be regarded as mere symptomatic affections. Among the genuine idiopathic cases may be mentioned, in the first place, those produced by external pressure, as habitually forcing the chest, in writing against the hard edge of a desk; or, which still more frequently occurs, and is productive of far severer effects, by the absurd, though fashionable use of tight stays, which, while they undermine the health, generally coop up and distort the chest into a shape equally ungraceful and unnatural. This barbarous custom cannot be too strongly inveighed against: for though the imprisoned young female may, by dint of habit, and where little exercise or exertion is required, be able to obtain a sort of triumph over the primary mischief of adhesions hereby produced, yet may she pave the way for an obstinate cough, phthisis, and lateral curvature of the spine; and, should she escape these, she will still have other inconveniences to suffer as soon as she reaches a state of pregnancy.

In attempting either to cure or to palliate the present species of pleuralgia, we must direct our eye as nearly as possible to its cause. If the affection be symptomatic, we must combat the original disease. If idiopathic, bleeding from the arm will generally be found requisite, and freely, if we suspect plethora; but locally by cupping or leeches, if it be from the mischievous habit of dress we have just reprobated, and the constitution, as is mostly the case, be relaxed and delicate. Here also dry cupping has been frequently found serviceable. Under all circumstances, a loose dress should be insisted upon. Blistering will often afford relief, and the discharge should be rendered permanent; but a seton or an issue will generally succeed better than a blister. Electricity by drawing sparks, has also proved frequently of use. [Laennec's opinion of magnetism has been noticed under the first species, where the other remedies in which he confides are also briefly mentioned.] Quiet rather than exercise is demanded, and the ablest course of internal medicines will be that which is best calculated to take off irritating and irregular action, as bark, valerian, snake-root, conium, and the various preparations of the hop.

CLASS III.

HÆMATICA.

DISEASES OF THE SANGUINEOUS FUNCTION.

ORDER I.
PYRECTICA.
FEVERS.

" II.
PHLOGOTICA.
INFLAMMATIONS.

" III.
EXANTHEMATICA.
ERUPTIVE FEVERS.

" IV.
DYSTHETICA.
CACHEXIES.

CLASS III.

PHYSIOLOGICAL PROEM.

In treating of the very important and extensive range of diseases included under the present class, let us first take a brief survey of the sanguineous function, which is the immediate theatre of their operation, and the means and instruments by which it is maintained.

This comprehensive subject may be most conveniently discussed under the three following divisions:—

I. The Machinery of the Sanguineous System.
II. Its Moving powers.
III. The Nature of the Fluid Conveyed.

I. The importance of the blood to the general health of the animal system, and its existence in every part of almost every organ, have been known in every country in which medicine has been studied, from the first dawn of its cultivation. It is not necessary to retrace the wild and idle hypotheses, that were started in ancient times to account for the means by which this universal fluid travels from one part to another, and appears in every quarter. It is enough to observe, that till the great and transcendent doctrine of the circulation of the blood was completely established, the acutest physiologists wandered about in darkness and uncertainty, seldom satisfying themselves, and still more rarely the world around them.

The opinion, indeed, of a circulation of the blood through the system, was loosely started by various writers, even of very early times; but, under every modification, it was found to be accompanied with so many difficulties, as always to be dropped almost as soon as it was revived, and rarely, till the middle of the seventeenth century, to show itself to any effective purpose. Hippocrates guessed at it; Aristotle assented to it; Servetus, or Servede, who was burnt as a heretic in 1553, imperfectly taught it by pointing out the smaller circulation, or that through the lungs; and our own illustrious countryman, Harvey, about a century afterward, gave a finish to the inquiry, by establishing the larger circulation, or that over the whole frame.*

The principal proofs of a circulation of the blood offered by Harvey, and those, indeed, on which we chiefly rely in the present day, are deduced from the disposition of the valves at the origin of the two great arteries; from the mechanism of the valves in the veins; and from the arrangement of those of the heart; from the possibility of draining an animal of its blood by opening either an artery or a vein; from the range of the arteries and the veins, and from what occurs when either the arteries or veins are opened, compressed, tied, or injected. All the valvular contrivances, to which a reference

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* Dr. J. R. Coxe, of Philadelphia, has lately examined Harvey's claims, with a view to show that instead of discovering the circulation of the blood, he merely "attached more firmly the cementing links of an extensive chain which time had rusted, and possibly, also, has added slightly to its more full perfection." Dr. Coxe supports his views by numerous quotations, from authors existing prior to Harvey, which evince much learned research.—See his Inquiry into the Claims of Dr. Wm. Harvey to the Discovery of the Circulation of the Blood, &c., Philadelphia, 1834.—D.

has been made, prevent the blood from taking any other course than what the present doctrine of the circulation inculcates. If we open an artery, the blood that jets from the puncture flows in a direction from the heart: and in a direction to the heart if we open a vein. A compression or ligature upon an artery, puts a stop to the blood that flows from above the ligature; but the same upon a vein puts a stop to the blood from below it, in which direction the vein immediately becomes distended. In like manner, an acid liquor, injected into the veins, coagulates the blood in the direction towards the heart, proving that the venous blood is everywhere travelling in this course. While an examination by the microscope of the vessels of the half-transparent textures of frogs, and other cold-blooded animals, confirms the view laid open by these phenomena, and shows to us a continual flow of the blood from the heart into the arteries, thence into the veins, and thence to the heart again; thus completing the circular career.

The arteries, therefore, generally speaking, terminate in veins; but by no means the whole of them, for many are exhalant or secretory, and terminate on the surface of membranes and other organs by minute orifices; which no microscope, however, has yet discovered, but whose existence we have every reason to believe, as we perceive a perpetual oozing of fluids, whose flow we cannot otherwise account for, into all the cavities of the body; which keeps their surfaces moist, and makes motion easy. While, according to M. Magendie, whose experiments, however, seem to want confirmation, other minute arteries terminate in lymphatics, which he makes as much a part of the sanguiferous system as the veins; the lymphatics conveying the more attenuate part of the arterial blood, slightly tinged of an opaline or rose-coloured hue, though sometimes of a madder-red; such as the fluid which oozes upon puncturing the lymphatics, or the thoracic duct, after a long fast. It is not necessary to examine into the correctness of this hypothesis in the present place, as we shall have occasion to notice it more at large when treating of the excernent system, which will be found to embrace both the absorbent and secretory vessels. It should be remarked, however, that, in M. Magendie's hypothesis, the veins, and not the lymphatics, are the absorbents of the body. —(*Précis Elémentaire de Physiologie*, tom. ii.)

Omitting then, for the present, the consideration of the lymphatics, the machinery, by which the circulation of the blood is principally effected, consists of the heart itself, the arteries, and the veins.

The heart, in the more perfect classes of animals, as mammals, birds, and most, though not all, amphibials, is a very compound organ; for in all these the blood, when received from the veins, is first sent from this central organ to the lungs to be duly aerated, or, according to Mr. Ellis's hypothesis, to be unloaded of its excess of carbon, and is afterward returned from the lungs to the same organ before its general circulation over the system commences. These classes, therefore, are said to possess a double circulation. And as the heart itself consists of four cavities, a pair, composing what is called an auricle and a ventricle, belonging to each of the two circulations; and as each of these pairs is divided from the other by a partition, these classes are also said to have not only a double circulation, but a double heart; a pulmonary and corporeal circulation and a pulmonary and corporeal heart.

[The division of the circulation into two parts, the *great aortic, systemic*, or *corporeal*, and the *less*, or *pulmonary* one, has generally been adopted since the time of the illustrious Harvey. Bichat conceived, however, that a division, founded on another principle, was preferable for the purpose of illustrating the objects of the blood's motion. The blood in one portion of its course is remarkable for its bright scarlet hue; in another, for its dark colour. In the first, it is flowing from the lungs to all parts of the body; in the second, it is returning from these parts to the lungs. The first is Bichat's *circulation of red blood*; the second, his *circulation of black blood* (*Anat. Gén.*, tom. ii.); a distinction, that at once gives a prompt introduction to the knowledge of the purposes of the circulation.]

The heart, in which the chief impelling power of the two vascular systems resides, is situated in the chest, between the lungs, and upon the diaphragm, by all the motions of which it is influenced. [The texture of the heart is fleshy, but very dense and compact, consisting of packets of fibres, more or less oblique, and variously contorted. The lesser ventricle, which has to propel the blood to a much greater distance than the right, is more fleshy and strong than the latter, which has merely to send the blood through the lesser or pulmonary circulation. When the chest and pericardium are opened in a living animal, the heart may be seen beating; the action of the auricles and ventricles alternating; that is to say, the two auricles contract together, and then the two ventricles. When the stethoscope is applied to the region of the heart, the distinct sounds of the action of the ventricles and auricles may be heard. At the instant when the pulse is perceptible in the arteries, a dull sound is audible, and directly afterward a clearer sound, similar to the noise of a valve. The former arises from the action of the ventricles; the latter from that of the auricles.*

* See Laennec, Traité de l'Auscultation, &c., tom. ii., p. 403, edit. 2. Some experiments made by Dr. Stokes and Mr. Hart, and of which an account is given in the Edin. Med. and Surgical Journal for October, 1830, p. 269, led them to conclude that Laennec was mistaken in his opinions respecting the impulse of the heart. "It is not, as he states, produced during the systole, but during the diastole of the ventricle. In point of fact, the pulse in the extremities, and the impulse of the heart, arise from one and the same cause; in the artery from its diastole, and, in the ventricular portion of the heart, from the same cause. This explains satisfactorily the want of coincidence between the impulse of the heart and the pulse at the wrist."—(Op. cit., p. 271.) The observations of the same experimenters lead to the following

The blood is returned from the greater circulation by the two large venæ cavæ into the right auricle. At the same moment, it is poured into the left auricle from the pulmonary circulation by the four pulmonary veins. The auricles being thus filled with blood, contract, when the blood, partly thrown back into the veins, produces by its reflux from the right auricle, a pulse, sometimes visible in the internal jugular veins of thin persons (*Magendie's Physiology by Milligan*, p. 360; and *Mayo's Outlines*, p. 67), but the main part of it is propelled into the right ventricle. The auricles then become relaxed, and the ventricles act, and drive back into the auricles such blood as happens to be situated behind the tricuspid and mitral valves, the valves placed at the communications between the auricles and ventricles, while the rest is thrown by the right ventricle into the pulmonary artery, and by the left into the aorta. All regurgitation from these two great trunks is now impeded by the operation of the semilunar valves, placed at their commencement.]

The heart is loosely surrounded by a dense and fibrous membrane, named from its situation, pericardium, possessing little sensibility, closely connected with the diaphragm, and reflected over the heart and its large vessels. Physiologists commonly represent its use to be that of confining the heart in its proper post; and of lubricating it, in its state of unceasing activity, with a peculiar fluid, denominated liquor pericardii, secreted from the capillary arteries of its internal surface. In a state of health, this fluid is small in quantity and of a reddish hue, some portion of the red parts of the blood being intermixed with it; but, in a morbid state of the membrane, it is apt to accumulate, change its properties, and lay a foundation for various complaints.—(See *Bostock's Elem. System of Physiology*, vol. i., p. 363, 8vo., 1824.)

[With respect to the considerable effect imputed to the pericardium in regulating the motions of the heart, and preventing this organ from *leaping* out of its place, as the expression is, one or two facts, brought to light by dissection, have materially weakened, if not quite subverted the hypothesis. A few instances have occured of the heart being found without any pericardium whatever, or any device to answer its purpose. Dr. Baillie has recorded a singular instance of this in a man, aged about forty, who died of an accidental complaint, without seeming to have suffered from the deficiency.—(See *Baillie's Works by Wardrop*, vol. i., p. 44.) Many examples are met with, where the bag of the pericardium and its reflected layer on the heart are completely adherent together, without any particular effect on the action of the latter viscus. A similar case to that in Dr. Baillie's works, is reported by M. Littre.—(*Hist. de l'Acad. des Sciences*, 1712, p. 37.) The circumstances which have most influence in fixing this organ, are, its situation between the two lungs, which enclose it nearly on every side; and its connexion with the large bloodvessels.

When, as an able physiologist has observed, we take into consideration the relative importance of the heart and brain, as far as regards mere animal existence, we shall be led to decide in favour of the former. In incubation, as the immortal Harvey pointed out, a beating point, a "punctum saliens," as he expresses it, which is the rudiment of the future heart, precedes the formation of other parts of the body, and is visible for some time before any trace of the brain can be distinguished. Acephalous fœtuses have been known to attain their full size in the womb, and even to have lived for a short time after birth, and then died from not being able to effect those changes, which are incidentally necessary to an existence of any duration. For example, a regular supply of nutritious matter is essential to the support of life; this can only be supplied by the introduction of food into the stomach by the act of deglutition; but this act, at least in the higher animals, cannot be performed without the intervention of the nervous system.—(See *Bostock's Physiology*, vol. i., p. 335.)

The sides of arteries are divisible into several strata of dissimilar substances, technically named *coats* or *tunics*. Mascagni, like the older anatomists who preceded him, represents both the arteries and veins as having four coats (*Prodromo*, pp. 61–64); but, his external one (ascitizia) is merely the cellular membrane that connects the vessels to the adjoining parts. —(*K. A. Rudolphi, Elem. of Physiol.*, vol. i., p. 90.) According to Rudolphi, and the generality of modern anatomists, all vessels have at least two coats, and the arteries three. Some writers, indeed, reckon only two proper arterial coats, and describe every arterial tube, exceeding one line in diameter, as visibly composed of one adventitious and two essential substances.—(See *Edinb. Med. Journ.*, vol. xviii., p. 258.) The three arterial coats are

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results:—1. That, in a state of health, the impulse of the heart precedes that of the arteries. 2. That the interval between the impulse of the heart and the pulse in the arteries is in the direct ratio of the distance of the vessels from the centre of the circulation. 3. The pulsations of arteries in different parts, but at equal distances from the heart, are synchronous. 4. The greater the distance, the longer will be the interval. 5. That, although the actual pulsations depend on the systole of the left ventricle, yet the diastole of the vessels does not occur synchronously in all parts of the body, but is progressive. In the production of the sounds of the heart, as audible with the stethoscope, Dr. Stokes and Mr. Hart consider that two causes are concerned. If, as they endeavour to show, Laennec's first sound, or that coinciding with the impulse, be produced during the diastole of the ventricle, *it must be produced by this cause, and the contraction of the auricle.* To the production of the second, on the other hand, attributed by Laennec to the contraction of the auricles, *the contraction of the auricles and the dilatation of the ventricles appear necessary.* With respect to the phrase *diastole of the vessels*, employed by Dr. Stokes and Mr. Hart, it would perhaps have been better to have substituted the term *pulsation*, as the experiments of Dr. Parry tend to prove, that there is no true dilatation or diastole in the arteries accompanying the pulse as will be presently noticed.

now generally called *external*, *middle*, and *internal*; denominations adopted by Dr. Jones, in his excellent work on hemorrhage; or *elastic*, *muscular*, or *fibrous*, and *membranous*. By Bichat, the latter tunic was styled the *common membrane of the system of red blood*, as it is not restricted to the arteries, but extends over the inner surface of the left ventricle and auricle of the heart, and lines the pulmonary veins, and, in short, the whole track of the scarlet blood.

In examining arteries, one of the first things observable is, that the sides of the large arteries are thick and elastic, so that, when these vessels are transversely divided, the section presents a regularly circular aperture.—(*Haller, Elem. Physiol.*, tom. i., p. 37.) Elasticity is rather obscure in the greater number of the textures of the animal body, a more prevalent feature of which is softness; yet it is very conspicuous in the arteries, and one thing that particularly marks their difference from veins, keeping their sides apart, even when they are empty. In fact, the arteries and some cartilaginous passages, like the windpipe, and the meatus auditorius of the fœtus, are the only tubes which are sufficiently elastic to remain open of themselves. It is to the elasticity of the arterial parietes that must be ascribed the sudden return of their naturally pervious condition, after their cavity has been momentarily effaced by compression, and the quickness with which an artery that has been bent straightens itself again. According to Bichat, this property is also manifestly concerned in the sort of locomotion which the arteries undergo from the influx of blood into them. If a tortuous arterial trunk be exposed in a living animal, the whole of it will be seen to rise up at each pulsation, quit its place, and straighten itself. As soon as an anatomical injection is thrown into the vessels of a very thin, diminutive subject, a locomotion of all the tortuous branches of the face becomes perceptible through the integuments. If the arteries had not a firm, elastic texture, they could not thus yield to the impulse communicated to them. The abdominal branches of the vena portæ, having no valves, may be injected like the arteries; but nothing resembling the above locomotion, is observable when the fluid is impelled into them. Bichat frequently made arterial blood circulate in veins by means of curved pipes, adapted to the vessels of a living animal; for instance, to the carotid and external jugular vein; yet, though a kind of pulsation, synchronous with that of the heart,—an evident rustling,—could be felt in the veins, thus injected with arterial blood, no real locomotion was discernible.—(*Bichat, Anat. Gén.*, tom. i., p. 289.)

The *internal coat* of the arteries, though extremely thin, and even semitransparent, is very close in its texture, endued with little elasticity (*Hunter on the Blood*, p. 117), and gives to those vessels their smooth polished lining. It does not exhibit the dun yellow colour of the middle coat; nor has it any fibrous appearance, being everywhere perfectly level and slippery.—(*Soemmerring, De Corp. Hum. Fab.*, tom. v., p. 57.) According to the experiments of Dr. Jones, it is elastic and firm *in the longitudinal direction*; but so *weak in the circular*, as to be very easily torn by a force applied in that direction.—(*On the Process of Nature in suppressing Hemorrhage*, &c., 8vo., Lond., 1805.) In the dead body, Bichat noticed that it seemed to have an unctuous fluid upon it, which he conceived, however, might not be the case in the living subject. It is of folds of the internal coat of the arteries, that the semilunar and sigmoid valves are formed at the origins of the aorta and pulmonary artery, the important uses of which valves have been already cursorily stated. The same membrane also forms the various ridges at the commencement of the arterial branches. It is very feebly united to the middle coat; and, according to Bichat, there is no cellular tissue between them. The morbid changes to which it is subject, prove its vascularity. Indeed, during life, it is particularly connected with arterial diseases. Thus its inner surface becomes the seat of adhesive inflammation, whenever the blood is prevented by a ligature from passing along it, or the opposite sides of the vessel are gently held in contact for a certain period. In elderly persons it is also noted for its singular tendency to ossify. Bichat calculated, that, in every ten individuals past their sixtieth year, the arteries of at least seven have earthy incrustations on them. These ossifications, which never affect the middle coat, always begin upon the external surface of the inner coat, being lined by a thin pellicle, which intervenes between them and the circulating blood, and is plainly the internal coat itself. These calcareous depositions in the arteries are not regulated by the laws of common ossification, the cartilaginous state rarely preceding them. The earthy matter is always deposited in detached plates, or scales, and the whole artery is seldom converted into one continued solid tube. Thus the portions of the internal coat, between the scales, were considered by Bichat as so many articular bands; the arteries thus ossified being composed of numerous pieces, moveable upon each other, and capable, in a certain degree, of yielding to the impulse of the circulation. While these earthy plates continue thin, the inside of the artery retains its natural smoothness; but, when they acquire thickness, they project into the cavity of the vessel; the thin pellicle breaks at their circumference; and they then adhere merely to the fibrous coat.

The *middle coat*, which is the thickest, consists of several layers of firm, compact fibres, considered by Hunter, Jones, and many other physiologists, as *fleshy* or *muscular*. It is sometimes called the *fibrous coat*, and often the *muscular*. Bichat names it *the proper membrane of an artery*, and observes, that it is very apparent in the large arteries, but less perceptible in their ramifications, where it is gradually lost.*

* Anat. Génér., tom. i., p. 270. Yet, according to Hunter's experiments, the smaller the arteries are, the more contractile and muscular they become in relation to their size; while, compara

Its fibres have a circular direction; being, however, rather obliquely connected, and interlaced with each other, than complete circles. According to Jones, they are of a peculiar nature, well supplied with nerves, and in form and disposition like muscular fibres, but different from them in possessing a remarkable degree of elasticity. They also differ from muscular fibres in being of a yellowish dun colour; in not having the same taste when boiled (*Rudolphi's Elem.*, vol. i., p. 80; *J. J. Berzelius, Animal Chym.*, p. 25); and in having no fibrine as one of their constituent parts. With respect to the colour of muscular fibres, a red colour is peculiar only to those of vertebrated animals, and, even in amphibia, they appear very pale, and, in numerous fishes, still paler. Many of the lower animals, as, for instance, the actinæ, possess a manifest power of contraction; yet, as Dr. Bostock observes (*Physiol.*, vol. i., p. 399), their substance is quite as unlike that of the muscles of warm-blooded animals, as the transverse fibres of the arteries are alleged to be. The non-muscularity of the middle coat of an artery, therefore, must not be inferred from the mere circumstance of its not corresponding in colour to the muscles of the human body.

Such physiologists as consider the middle coat of the arteries to be muscular, among whom are Haller, Walther, Hunter, and Soemmerring, build their opinions upon various grounds, some of the firmest of which were explored by Mr. Hunter. It is also argued, that the fibres become soft and grayish in the small arteries, and assume much of the appearance of those in the intestines; that, notwithstanding the dryness, resistance, elasticity, and fragility of the arterial fibres, not more difference really exists between them and the muscular fibres, than between those of different muscles; and that the muscularity of arteries is proved by their functions. With such statements Béclard joins another, which disagrees with the researches of Berzelius; namely, that he has detected a proportion of fibrine in the middle coat of the arteries.*

Dr. Jones represents the elasticity of an artery as so particularly inherent in the middle coat, that, if this coat were separated from the two others, it would retain its cylindrical form, while they would collapse. This statement is certainly not applicable to the largest arteries, the outer coat of which possesses very considerable elasticity, and perhaps even a greater degree of it than the middle one.

The *external coat* of the arteries is often described as condensed cellular membrane. Its texture towards the middle coat is close and smooth, but, more externally, it is open and rough, in consequence of the cellular substance by which it is connected to an additional covering named the arterial sheath. The external coat is remarkable for its density, whiteness, and great elasticity. If an artery be surrounded with a tight ligature, the middle and internal coats will be completely divided, while the external coat will remain entire. Hence, the strength of an artery must depend in a great measure upon this coat, and its importance may be conceived from the fact, that it encloses and transmits the vasa vasorum, by which the artery itself is nourished.

The sheath of arteries is merely the lamellated cellular substance that forms around them a sort of canal. On one side it is connected to their external coat by numerous filaments of cellular membrane; while, on the other, it is continuous with the common cellular substance. It does not exist where arteries are covered by serous membranes. Other arteries are likewise destitute of it, apparently in consequence of there being no cellular membrane in their vicinity, as in the brain. In the limbs, it is generally very compact; but, in some other situations, it is quite lax, as around the spermatic arteries.—(*Béclard*, op. cit., p. 79.)

According to Bichat, although the cellular tissue forms the external coat of the arteries, and serves for the insertion of the arterial fibres, it is not continued into their interstices; a peculiarity, he says, in which the arterial tissue differs from that of muscles, veins, &c. This absence of cellular tissue he also remarked between the middle and internal coats; though the observation disagrees with the statements of Haller, Soemmerring, and others. It is to the want of cellular substance in the proper arterial tissue, that Bichat refers a great deal of the fragility by which it is characterized; the difficulty of arterial dilatations; the freedom of arteries from fat, anasarca, hydatids, cysts, and various tumours, to which the cellular membrane is liable.—(*Anat. Gén.*, tom. i., pp. 285–287.)

Arteries are furnished with minute arteries and veins of their own, technically named *vasa vasorum*, and without the agency of which the nutrition, growth, and morbid states of the arterial system would defy all rational explanation. These small nutrient arteries originate from the neighbouring ramifications, and not from the artery itself, to which they are distributed. One

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tively speaking, the proportion of elastic matter is most abundant in the great arteries.—Ed.

* Béclard, Additions à l'Anat. Gén., p. 78. According to Cuvier, the middle coat of the arteries, which is fibrous in man and the horse, is decidedly muscular in the elephant. Dr. Wedemeyer, summing up all the objections made to the doctrine of the muscularity of the arteries, states, that, whereas the true muscular fibre is reddish, soft, extensible during life, and very brittle after death, the fibrous coat of the arteries is, on the contrary, yellowish, firm, hard, and very elastic even after death; that its vasa vasorum do not distribute themselves as in the muscular fibre; that it does not contain any fibrine; that it is not excited to contract by galvanism, or any other irritant; and that, in its extreme liability to the deposition of calcareous matter between itself and the inner serous coat, it shows its resemblance to white fibrous tissue in other parts of the body, as well as its difference from true muscular tissue, between which and serous membranes calcareous matter is rarely secreted.—See Untersuchungen über den Kreislauf des Bluts, &c., Hannover, 1828.—Ed.

exception to this arrangement is pointed out by Bichat: the aorta, at its commencement, gives off the coronary arteries, which, besides supplying the heart, ramify on that great vessel.

Absorbent vessels are very manifest around the large arteries, for instance, the crural. The enlargement of the cavities of arteries, as the body, limbs, and other parts increase in size, implies the continual performance of absorption in the arterial structure. Other powerful arguments in support of this inference may be drawn from various pathological facts, especially from the liability of arteries to ulceration.

According to Soemmerring (*De Corp. Hum. Fab.*, tom. v., p. 59), all the arteries have nerves, which also appear to him to be smaller and fewer in the large trunks, than in the branches of middling diameter. Hence he concludes, that the more minute arteries are, the greater is their proportion of nerve in relation to their size. He states, that the vertebral artery, and the large mesenteric branches in thin subjects, can be seen without any difficult preparation, surrounded by a beautiful network of nerves. Lucae asserts that he has followed the nerves even into the substance of arteries. The late Mr. Wilson also succeeded in tracing filaments of nerves into the arterial coats. "I can have no doubt," he remarks (*On the Vascular System*, p. 155), "of nervous filaments communicating with the packets of muscular fibres, as there is sufficient proof, in the action of blushing, that these fibres are much influenced by emotions of the mind." The heart and larger arteries receive but few nerves directly from the cerebro-spinal portion of the nervous system, their nerves being principally supplied by the ganglionic system of the great sympathetic, which appears to have the organic or nutritive functions of life more especially under its influence. The two divisions of the nervous system are, however, intimately connected by the numerous branches which the great sympathetic receives from the spinal marrow, and by a few smaller branches coming from the brain. In an experiment made by Sir Everard Home, the great sympathetic nerve was irritated in the necks of dogs and rabbits, and a temporary increase of pulsation is said to have been thereby produced in the carotid arteries.—(*Phil. Trans.*, 1814.) In experiments of this kind, the physiologist should be careful not to confound the general disturbance of the circulation from the pain and agitation, with a local augmentation of the pulse of a particular artery from the effect of the irritation of the nerve or nerves, by which it is supposed to be influenced.

The veins are membranous tubes, like the arteries, but differ from these vessels in having a thinner and less fibrous texture, and in being often furnished with valves, which, in the arterial system, are nowhere found, except at the roots of the aorta and pulmonary artery. The veins are nearly destitute of that texture which is seen in the middle coat of the arteries, and are consequently to be regarded as little more than simply elastic tubes. As Soemmerring remarks, it is only in the large trunks of the veins that any fibrous appearance can be traced. —(Op. cit., vol. v., p. 328.) Their office is to return the blood to the heart, after it has served the purposes for which it was sent from the two ventricles of that organ. Their action is, therefore, entirely mechanical, and the blood is transmitted by them (as far, at least, as they themselves are concerned) upon hydraulic principles.—(*Bostock's Physiol.*, vol. ii., p. 403.) That the large veins have longitudinal fibres is generally admitted; but the transverse or circular* ones ascribed to them by Marx (*Disputatio de Structura atque Vita Venarum*, Carlsr., 1819) seem to Rudolphi to be nothing more than cellular membrane. He has never seen distinct circular fibres in the veins of the human subject, nor even a single one in the vena cava of a horse.—(*Elem. of Physiol.*, vol. i., p. 90.) The force with which the veins resist any power tending to tear them is much greater than might be expected from their apparent tenuity. Their area is much larger in proportion to their sides than that of the arteries; and, according to the experiments and calculations of Wintringham, the proportion which the thickness of the arterial coats bears to that of the venous tunics, is in the largest trunks as fifteen to one. The veins also bear greater distention than the arteries without bursting. In Wintringham's experiments, the vena cava inferior sustained a column of water weighing 176 lbs., while the aorta, in the same situation, was burst by a column of 158 lbs. 11 oz. The iliac vein was to the artery in this respect as 1034 to 1000. But in the vessels of the viscera, the arteries exceeded the veins, and, in an old dog, the aorta was stronger than the vena cava. In the living subject, however, the veins are found more liable to dilatation and rupture than the arteries. They yield more readily, and admit of greater dilatation. The inner coat or lining of veins is thinner, more dilatable, and less brittle than that of arteries. Ossification never takes place in it; and as all what Bichat calls the *common* membrane of the black blood is of the same nature, the tricuspidal valve, with the semilunar or sigmoid valve of the pulmonary artery, and the lining of that vessel, never exhibit bony deposites, which are so common in the corresponding parts of the system of red blood.

The valves of the veins are produced by folds of the internal coat. In the larger trunks they are generally arranged in pairs, as at the entrance of the internal jugular into the subclavian in the large veins of the leg and arm, and the vena azygos. Three valves situated together are sometimes observed, but not frequently. Solitary valves are frequently seen in the smaller veins. The size of the valves is proportioned to that of the vessel, but they are not always large enough to close it completely. The valves are chiefly found in veins which have a perpendicular position, as in the limbs, penis, testicle, and the vena azygos. They are particularly

* "We have ascertained, by very minute dissections, that the veins have no circular fibres."—See Doane's Meckel, vol. i., p. 127.

numerous in the limbs and cutaneous veins, and very scarce in the viscera. There are no valves from the right auricle down to the iliac veins; none in the hepatic, venal, uterine, cerebral, or coronary veins, excepting the single one at the mouth of the coronary in the auricle itself. According to Haller, there are none in the small veins generally, the diameter of which is less than one line. The valves begin in the iliac veins, where, however, they are not numerous; and they are found in such branches of the hypogastric veins as do not come from the uterus and bladder. The effect of the valves in compelling the blood to run in one direction in the veins is manifest. They lie close to the side of the vessel, and make no resistance to the blood's natural course; but when that fluid is repelled in the vein, it lifts up the loose edge, and causes the margins of the two valves to form a partition in the cavity of the vessel. Hence the blood cannot retreat farther than the situation of the first pair of valves; consequently any portion of a venous trunk has to sustain only the quantity of blood contained between the two valves which bound it. Had it not been for this arrangement, the whole column of venous blood, when its return to the auricle was impeded, would have pressed on the minute veins with a degree of force which the coats of these vessels could not have resisted. The necessity of such a structure arises out of the comparatively slow motion of the venous blood, the absence of an impelling agent at the commencement of the venous circulation, and the degree in which it is influenced by the force of gravitation. In consequence of the valves, all pressure must have the effect of sending the blood on towards the heart. For the same reason, the swell of the muscles, when they act, must promote the venous circulation.

The coats of veins are furnished with minute arteries and veins, not essentially different from the nutrient vessels of the arteries. Their exhalants and absorbents are calculated to be few; and their supply of nerves much inferior to what the arteries possess.

The following are some of the considerations which led Mr. Hunter to believe the arteries muscular as well as elastic. When the inside of the arteries and veins of the alligator and turtle is inspected, he says, fasciculi of muscular fibres can be plainly seen.—(*On the Blood*, p. 118.) But in order to prove the point, he had recourse to experiments, in which he contrasted the action of the arteries with that of simple elastic substances. "Action in an elastic body," he observes, "can only be produced by a mechanical power; but muscles acting upon another principle can act quickly or slowly, much or little, according to the stimulus applied; though all muscles do not act alike in this respect. If an artery is cut through, or laid bare, it will be found that it contracts by degrees, till its whole cavity is closed; but if it be allowed to remain in this contracted state till after the death of the animal, and be then dilated beyond the state of rest of elastic substances, it will only contract to the degree of that state. This it will do immediately; but *the contraction will not be equal to that of which it was capable while alive.*

"The posterior tibial artery of a dog being laid bare, and its size attended to, it was observed to be so much contracted in a short time, as almost to prevent the blood from passing through it, and, when divided, the blood only oozed from the orifice.

"On laying bare the carotid and crural arteries, and observing what took place in them, while the animal was allowed to bleed to death, these arteries very evidently became smaller and smaller.

"When the various uses of the arteries are considered; such as their forming different parts of the body from the blood; their performing the different secretions; their allowing at one time the blood to pass readily into the smaller branches, as in blushing, and at another preventing it altogether, as in paleness from fear; and if to these circumstances we add the power of producing a diseased increase of any or of every part of the body; we cannot but conclude that they are possessed of muscular powers."

Certain experiments to which Mr. Hunter had recourse, led him to infer, that the large arteries are most elastic, and the small ones most muscular. He injected the uterus of a cow, after it had been separated from the animal more than twenty-four hours, and he allowed it to stand another day, at the end of which the larger vessels had become much more turgid than they were when first injected; and the smaller arteries, he says, had contracted so as to force the injection back into the larger. He regarded this as a proof that the muscular power of the small arteries is superior to that of the large ones, and that they retain it longer after their detachment from the rest of the system. The latter character is one that Mr. Hunter particularly ascribed to all the involuntary muscles, to which class the arterial fibres belong.—(Op. cit., p. 115.)

Nothing can differ more widely than the relative spissitude and power ascribed to the elastic and muscular arterial coats, compared with each other in different parts of the circulating course. As the heart is the salient point of the circulation, and pours forth about two ounces of blood at every jet, the greatest force is exerted against the arteries that immediately issue from the heart. Here, therefore, we find the greatest resisting power; for, in the aorta and pulmonary artery, the elastic tunic is stronger than the muscular, by which contrivance these vessels are never too much dilated by the action of the heart in its contraction, or, as the Greeks call it, systole. In like manner, this tunic becomes stronger at the bending of the joints, and continues so through the whole length of the curve; and the same provision takes place at the sharp angles made by a trunk and its branch, or at an angle formed by the division of one trunk into two. As the arteries, however, recede from the heart, the blood, resisted at every step by the elastic tunic of the canal it flows through, progressively loses its impetus, and a less elastic power becomes necessary, and is actually pro-

vided. At a considerable distance, therefore, from the heart, in whatever direction the arteries ramify, their muscular tunic soon balances their elastic, and gradually becomes superior; till at length, in the capillary arteries, it is nearly, if not altogether, the only tunic of which the canal consists: whence the ease with which these vessels collapse on some occasions, as from loss of blood, or the exercise of terror, or any other depressing passion; and the equal facility with which they open in other cases, as in the sudden blush of shame or modesty.

[Many of the phenomena which Mr. Hunter and other distinguished physiologists refer to the muscularity of the arterial system, Bichat ascribes to a property which he terms contractility of tissue, that is to say, a property depending upon organization, and not upon life. He takes a view of such contractility as operating in the transverse and longitudinal directions. In the former it is much more strongly marked than extensibility. He observes, that as soon as an artery ceases to be distended with blood, it evidently shrinks. Hence:—1. The conversion of the umbilical artery and ductus arteriosus, after birth, into ligamentous impervious substances. 2. The obliteration of an artery all the way from the place of a ligature to the point at which the first collateral branch goes off. 3. The diminution of the calibre of an artery between two ligatures, as soon as the blood between them is discharged by a puncture. 4. In experiments upon dogs, into which blood was transfused, with the view of causing an artificial plethora, Bichat found that the diameter of the arteries was nearly double what it was in dogs of the same size, after profuse hemorrhage. The same difference, he says, may be noticed in two animals of equal size, when one has been killed by hemorrhage and the other by asphyxia. 5. These experiments left no doubt in Bichat's mind of the fulness and smallness of the pulse, an artery being really more or less bulky according to the quantity of blood which it contains.—(See also *Hunter*, op. cit., p. 124.) There is a limit, however, beyond which the vessel cannot be extended; but, from a deficiency of blood, it may contract to such a degree as to represent as it were but a thread.

Mr. Hunter calculated the degree of contraction that takes place in the different arteries of an animal bled to death. He subjected to very careful admeasurement the arteries of a horse killed in this manner, and whose muscles had all been allowed to contract equally, whence "we might reasonably presume that the vessels, at least such of them as were furnished with muscles, would also be contracted, the stimulus of death acting equally upon muscles in every form and every situation." He removed from the carcass sections of the aorta, iliac, axillary, carotid, crural, humeral, and radial arteries, with the precaution of not altering in the least their texture, or state of contraction. He measured them when slit open, so as to learn their greatest degree of contraction. He then stretched them transversely, and measured them when elongated as much as possible. Lastly, he measured them a third time, in the state to which they recovered by their own powers. He found that the power of recovering was greatest near the heart, and gradually diminished towards the extremities of the body. This was owing, as Mr. Hunter supposed, to the extension having entirely destroyed the power of muscular contraction, which is comparatively greatest in the small arteries, while the degree of contraction which actually took place after such extension, proceeded from elasticity, which is most abundant in the larger trunks.

Here what Mr. Hunter imputes partly to muscularity and partly to elasticity, Bichat would refer to contractility of tissue. The latter is of opinion, that most physiologists have confounded this kind of contractility in the arteries with irritability, the difference of which is shown by its always ceasing a few hours after death, whereas the contractility, spoken of by Bichat, takes place after death, though in a less marked degree.

Mr. Hunter, who, as we have seen, refers all contractility of the arteries to muscularity and elasticity, relates some experiments, the tendency of which is to prove that they have no muscular power of contraction in the longitudinal direction. In the first experiment, a longitudinal section of the aorta ascendens, measuring two inches, after having been stretched and allowed to contract again, measured the same length. The same thing was observed in portions of the carotid and humeral arteries. "These experiments," Mr. Hunter says, "appear to be decisive, and prove, that *the muscular power acts chiefly in the transverse direction;* yet, it is to be observed, that *the elastic power of arteries is greater in the longitudinal than the transverse direction.* This appears to be intended to counteract the lengthening effect of the heart, as well as that arising from the action of the muscular coat; for the transverse contraction of that coat lengthens the artery, and therefore stretches the elastic, which again contracts upon the diastole of the artery."—(Loc. cit., p. 128.)

Many of Mr. Hunter's observations embrace the subjects of the vital properties of the arteries; as, for instance, whenever he reasons about the disputed question of their muscularity. Bichat, after considering the elasticity, extensibility, and contractility of tissue, or the properties which he believed to depend on the structure or organization of arteries, offers some interesting reflections on their *vital properties.* First, he inquires, whether *animal sensibility* exists in them? The application of a ligature to an artery, he says, sometimes produces pain; but more frequently not. The latter statement the editor deems incorrect, or, at least, repugnant to what he has noticed in the practice of surgery. Nor can Bichat's observation be reconciled with what he presently says about the great sensibility of the inner coat of the arteries. However, as he admits that they sometimes give pain when tied, this affirmative proof of their sensibility is all that can be required.

He states, that, in whatever manner the carotid of a dog be irritated, whether with a scalpel, acids, alkalis, &c., the animal never betrays signs of pain. With regard to the inner coat, however, he found, that, although the injection of a mild fluid, like water, at the temperature of the animal, caused no uneasiness, the injection of a stimulating fluid like ink, diluted acids, wine, &c., excites very acute pain.—(*Anat. Gén.*, tom. i., p. 295.)

Animal contractility, as Bichat terms it, or (as it might be expressed) contractility under the influence of the brain, and resembling that of the voluntary muscles, is stated by this author not to belong to the arteries. Such contractility, he asserts, could only depend upon a connexion between these vessels and the brain; yet irritation of this organ, producing convulsions of parts subject to the will, has no effect upon the arteries; and opium, which, in a certain dose, paralyzes those parts, leaves the vessels unaffected. Another assertion made by Bichat is, that, if the spinal marrow be exposed, irritated, and compressed, the action of the arteries is neither increased nor diminished, even though the voluntary muscles be at the same time convulsed or paralyzed from it. On the other hand, the experiments of Dr. Philip contradict Bichat on this interesting point, and show that the motion of the blood in the capillaries is influenced by stimulants, applied to the central parts of the nervous system; which circumstance, if established as a fact, must depend upon the contractile power of those vessels.—(*Exp. Inquiries*, &c., p. 291, 292, 2d edit.) In direct opposition to the result of Sir Everard Home's experiment, already mentioned, Bichat found the arteries to be quite unaffected, either by irritation of the cerebral nerves, which accompany them, or by that of the ganglionic nerves, which are irregularly and abundantly distributed upon their external surface. He even tried galvanism without any effect.

The same physiologist represents the arterial system as destitute of what he calls *organic sensible contractility*, or that kind of contractility which, in his system, is classed as one of the properties of organic life, and illustrated in the action of the heart, intestines, &c. In whatever manner an artery be irritated in the living body, he asserts that it constantly remains motionless. Even when the arterial coats are stripped off layer by layer, either in a living animal, or one recently killed, none of that trembling and palpitation is perceived, which occur in the fibres of organic muscles under similar circumstances. The conclusion to which Bichat's experiments lead him is, that during life *the arteries have no contraction that is under the vital influence*, and he refers all the circumstances usually brought forward to prove the contrary, to contractility of tissue. Thus, he observes, when an artery is tied at two points, and opened in the interspace, it empties itself of the blood contained in it, as well as of any other fluid accidentally placed in it. The same thing also occurs, when only one ligature is so applied, that it intercepts the influence of the heart. The dependance of these circumstances upon contractility of tissue, he argues, is so much the fact, that, as long as the artery is free from putridity, they take place in the dead subject. If an artery be filled, and then opened, it empties itself by contracting. The contraction produced by defect of extension, is what Bichat regarded as a test of contractility of tissue; irritability, or organic sensible contractility, always implies the operation of a stimulus.

Bichat describes *organic sensible contractility*, or *tonicity*, as plainly existing in arteries. In those which pulsate, he says, it is restricted to the purposes of nutrition; but, as soon as the influence of the heart on the motion of the blood ceases, which (according to his theory) is probably at the beginning of the capillary system, then the organic insensible contractility begins to have effect, not only upon the nutrition of the coats of the vessels, but also upon the circulation within them. Indeed, in this physiologist's views, the circulation in the small vessels is altogether maintained by their tonic power, the heart having absolutely no concern with it.

Bichat represents the arteries as endued with *organic sensibility*, which he says is never separated from the organic insensible contractility. In the large trunks, however, where it is only necessary for their nutrition, it prevails in a very obscure degree. It is by the organic insensible contractility, and the organic sensibility, that Bichat would solve many of the difficulties attending the comprehension of the process of secretion. What Mr. Hunter and numerous modern physiologists would ascribe to the action of vessels, Bichat refers to those two rather imaginary properties of the minute arteries. The difference seems, after all, to consist rather in words than meanmg.

The following is a summary of the principal arguments, respecting the muscularity of arteries:

1. When arteries are stimulated in living animals with a sharp instrument (*Verschuir, De Arter. et Venarum Vi Irritabili*, p. 17), strong acids,* or electricity (*Birker, De Nat. Hum.*, p. 45, Lugd. Bat.), the portion of the vessels so stimulated is declared by the subjoined experimenters to contract. On the other hand, the contraction of an artery on its being pricked, variously stimulated, or even galvanized, is positively denied by Bichat,† who ascribes the

* Zimmermann, De Irritabilitate, p. 24. Larry, in Vandermonde's Journ., tom. vi., p. 7. Verschuir, op. cit., p. 19.

† Wedemeyer's experiments support the doctrine of Haller and Bichat, that the greater arteries do not possess irritability, or vital contractility. With a battery of fifty pairs of plates, Wedemeyer galvanized the carotid artery, and the thoracic and abdominal aorta, sometimes during life, sometimes immediately after death, caused in various modes, and the artery was sometimes left in connexion with the heart, and sometimes removed from the body; but its result was always the same: he never could remark any contraction. Neither could he excite any contraction with mechanical stimulants. Wedemeyer could not perceive that galvanism produced any contraction of the arteries of the umbilical cord and placenta, as asserted by

change produced by acids to a kind of crispation, attended with chymical injury of structure, whereby the vessel is for ever prevented from resuming its pristine diameter, which it would do, if the contraction depended on mere stimulation. But in opposition to him, we have again the galvanic experiments of Giulio and Rossi, and that of Sir E. Home, who, as we have noticed, produced violent throbbing in the carotid by applying alkali to the great sympathetic nerve.*

2. Arteries are said to be capable of a perisaltic motion. The editor is not acquainted with the facts on which Soemmerring (*De Corp. Hum. Fabricâ*, tom. v., p. 66), founds this statement; unless it refer to Dr. Whytt's exploded hypothesis of an oscillation in the minute vessels.

3. The doctrine of the contractile power of the capillaries has received important corroboration from the experiments of Drs. Wilson Philip, Thomson, and Hastings. These gentlemen placed the web of a frog's foot in the microscope, and distinctly saw the capillaries contract upon the application of such stimulants as cause the contraction of the muscular fibre. Dr. Hastings found, also, the large arterial trunks, and even the veins, contract, as Verschuir and others had previously noticed. Dr. Thomson has seen the arteries contract in such a degree, on the application of ammonia, that their cavity appeared to be quite effaced. On the contrary, the muriate of soda always caused a dilatation of them.

4. Arteries are alleged to pulsate very differently in different parts. With reference to strength and fulness of the vessels, the editor's own observations enable him to corroborate this fact; but he has never known an artery of one part of the body beat more slowly or quickly than the rest of the arterial system. The occurrence, however, is mentioned by writers as a fact. An increased flow of blood to any particular organ, whether in health or disease, is inexplicable, unless some change in the diameter, or action of the vessels supplying it, be taken into the account.

5. In one case upon record, the pulse of the arteries of a paralytic arm was quite indistinguishable; while, in the other arm, it was full and strong.—(*Hoffmann von der Empfindlichkeit*, &c., § 842.) Here it is argued, that, if the pulse had depended upon the heart alone, it would have been as strong in the paralytic as in the healthy limb. Some highly instructive examples of the entire want of pulsation in the arteries of paralytic limbs are recorded by Dr. Storer,* by whom, however, this effect is described as exceedingly uncommon.

6. Another argument is derived from the operation of local stimulants in producing inflammation. The lachrymal gland, when the eyes are irritated, or when it is itself affected through the mind, pours fourth tears. The saliva is more copiously secreted from the effect of stimulating medicines, or of the sight and smell of victuals.

7. It is argued also, that, as the nerves of arteries are quite evident and abundant, these vessels must be connected with the brain, and be influenced by affections of the nervous system. Putting out of the present consideration the results of experiments, in which the effect of stimulating the nerves of arteries was examined, and about which the flattest contradictions prevail, let us only recollect the quick action of blushing; the instantaneous paleness of fear; the influence of the mind over the secretions; and the sudden distention of the corpora cavernosa from mental causes; and we can scarcely fail to conclude, that the arteries are under the influence of the nervous system.

8. One important argument in favour of the contractile power of the arteries, is derived from cases in which the circulation was carried on, although the heart was either wanting, defective in its structure, or more or less ossified. Examples of the first kind are recorded by Hewson (*Exp. Inq.*, vol. ii., p. 15) and Brodie (*Phil. Trans.*, 1809, p. 161), and of the latter by A. Burns, and other writers. According to Mr. A. Burns, the left ventricle of the heart may be so ossified, that it can have no share in propelling

Osiander. The apparent contraction of the aorta under electricity, he says, is nothing else than increased pulsation, arising from the action of the electric fluid on the heart, which is excited to increased action. Oesterrheicher has observed in fishes alternate contraction and dilatation of the bronchial artery. Wedemeyer has made the same observation; but says that this may easily be accounted for, because, near the origin of the vessel at the heart, distinct muscular fibres may be traced, not at all like the hard fibrous coat of the arteries in general. The same structure, he says, is particularly conspicuous in the torpedo. On the other hand, Cuvier's statement, that the fibrous coat of the arteries in the elephant is plainly muscular; and Béclard's, that the same tissue in the arteries of the human subject actually contains fibrine; must not be forgotten in forming a judgment on this contested point.

* Oesterrheicher explains this fact on a different principle: if a nerve, supplying any vessel, be divided, and then stimulated at the end farthest from the brain, the artery does not pulsate with greater force; and hence, if its pulsation is increased when the nerve is not previously divided, this arises from nothing else than the increased action of the heart, caused by the pain inflicted on the animal.—Ed.

* Trans. for Improvement of Med. Knowl., vol. iii., p. 448. Such cases seem to affect very much the doctrines maintained by Wedemeyer and others, that all the phenomena of the arterial pulse may be imitated exactly, when life has been for many hours extinct, by impelling water into the vessels by successive jets from a syringe; that the pulse is owing entirely to the impulse communicated by the heart, in consequence of which the artery is partly dilated, and partly made to shift its place; that all the phenomena of the circulation may be referred to the elastic contractility of the arterial coats, and that the greater arteries, therefore, contribute to move the blood forward only by restoring, through their elastic reaction, the force expended in dilating them. The power of arteries to contract beyond the point to which their elastic materials will bring them, as demonstrated by Hunter, is here also to be remembered, as not admitting of explanation without reference to a vital contractility.—Ed.

the blood into the arteries. Yet the circulation is continued through all parts of the body. And, from what happens in cases of ossified arteries, he infers, no doubt with considerable exaggeration, that the circulation can be much better conducted without the action of the ventricles, than without the reaction of the arteries. The cases of ossified heart reported by Mr. A. Burns are highly interesting.—(*On Diseases of the Heart*, p. 129, &c.)

Drs. W. Philip and Hastings (*Treatise on the Mucous Membrane, Introd.*, p. 51), in their experiments, saw the circulation in the small vessels continue for some time after the heart had been removed from the body; a circumstance hardly explicable without the admission of an action in the vessels themselves.

9. It is decidedly proved, that, during life, an artery can contract below its middling diameter, or that width to which its mere elasticity would reduce it. How can this be effected, but by muscularity?

10. Arteries, empty at the moment of death, and even contracted below their middling diameter, recover their ordinary size as soon as the vital influence is completely exhausted. Their muscular power is then annihilated, and their elasticity predominates.—(See *Experiments in Hunter on the Blood*, p. 116, &c.)

From the tenour of all that has been said, the existence of a power of contraction in the minute vessels can hardly be doubted, whatever may be the opinion espoused respecting the muscularity of the arterial trunks. Some physiologists, not exactly agreeing with Mr. Hunter, may yet be disposed to consider the latter simply in the light of a mechanical or hydraulic system, and the capillaries as the physiological or vital organs.*

The wisdom with which the structure of the body is contrived, is most convincingly exemplified in the vascular system. We have instances of it in the universal situation of the arterial trunks in the direction of the flexion of the joints, whereby they are hindered from being overstretched, and are protected from external injury; in their occasional tortuosities, by which they are enabled to adapt themselves to the continually changing positions of organs, without suffering from extension; and in their anastomoses, or frequent communications with one another, by which the necessary supply of blood to parts is rendered secure, when any particular trunk is temporarily obstructed by pressure, or permanently obliterated by this and other causes.

After having divided, and ramified to a considerable extent, and in a manner generally resembling the branching of a tree, the arteries, both of the greater and lesser circulations, terminate in the general capillary system. The exact point at which the arteries end and the capillaries begin, cannot be demonstrated. According to Bichat, it is where the blood ceases to be at all under the influence of the heart, and the circulation is first maintained altogether by a contractile power of the minute vessels, to which he allots the mysterious term of insensible organic contractility. But this imaginary limit would not satisfy many physiologists, particularly those who argue that the action of the heart always extends its effect to the capillaries, as well as the arteries in general. Anatomists commonly describe the arteries as terminating in excretory tubes, exhalants, veins, &c.; but, in reality, the capillary system constantly intervenes between those vessels and the arteries. The microscopic investigations of Dr. Marshall Hall into the action of the capillary vessels tend to show, that they are a network of pellucid vessels, differing from the small arteries in the circumstance of their subdividing without becoming smaller; and freely anastomosing with each other, like nervous plexuses, forming thus, as Bichat always inculcated, an intermediate system of vessels between the arterial and venous system.* As already observed, while the large arteries are regarded by some physiologists as merely mechanical tubes, the minute ones, or capillaries, are known to be the part of the vascular system, in which all the important objects of the circulation are mainly prepared and accomplished, as nutrition, secretion, the oxydation of the blood, its decarbonization, &c.†]

* See Bostock's Physiology, vol. i., p. 403. Dr. Marshall Hall inclines to the opinion, that the capillaries are rather passive than active canals, through which the blood is circulated by the impulse of the arteries, the absorbing action of the veins, and also by capillary attraction. He fully admits, however, the contractility of the small arteries.—(On the Circulation, &c.) Galvanism would appear, from the investigations of Dr. Reuss, of Moscow, and those of M. Dutrochet, Mr. Faust, Dr. Mitchell, and Dr. Stevens, to exercise a locomotive influence on the circulating fluids. For information on this curious question, see Nouvelles Recherches sur l'Endosmose et l'Exosmose &c., par M. Dutrochet, 1828; Faust's Experiments, &c., on the Endosmose and Exosmose of Gases, and the Relation of these Phenomena with Respiration; Amer. Journ. of Med. Science, vol. vii., Nov., 1830; Stevens on the Healthy and Diseased Properties of the Blood, &c.—Ed.

* On the Circulation of the Blood, by Marshall Hall, M. D. Wedemeyer's account of the structure and disposition of the minute vessels is contained in his "Untersuchungen über den Kreislauf des Bluts," 1828; or in the 100th No. of the Edinb. Med. Journ., July, 1829.

† With regard to exhalant pores, Dr. Wedemeyer objects to the notion that they are visible and *organic*, or, as he explains the term, endowed with a species of contractility, by means of which they retain certain substances, and discharge others. He maintains, that if any such pores existed, they would be perceptible with the aid of the microscope; and he considers that all the phenomena of exhalation may be produced through invisible pores, or the interstices between the ultimate particles which form the organic tissues, and may be explained by the phenomena of capillary attraction, as modified by the action of the nervous system on textures. In these views, as has been correctly noticed (Edinb. Med. and Surg. Journ. for July, 1829, p. 87), he approaches closely to the theory which M. Dutrochet has founded on his discovery of endosmose and exosmose. (See op. cit., No. 99.) Magendie's experiments tend to establish the fact, that the exhalants do not terminate in open orifices, but that exhalation and

I have observed, that the force with which the blood is at first projected from the heart, is progressively diminished by the resistance it encounters in the thick and powerfully elastic tunic of the trunks or large arteries into which it is immediately propelled. There are two other causes which co-operate in producing a progressively diminishing force. The first is the short angles against which the blood has to strike at the origin of all the different branches; and the next, and most important, is the larger diameter of the general mass of the arteries, compared with that of the heart, or the arteries from which they immediately proceed; the range of the diameter augmenting in proportion to the increase of the ramifications. From experiments, indeed, made by Mr. John Hunter on the carotids of camels and swans (*On Blood, Inflammation*, &c., part i., sect. viii., p. 170), the very same arteries appear gradually to widen from the end nearest the heart to that most remote from it. From all which he concludes, that the aggregate diameter of the arterial system forms a cone, whose apex is at the heart. And he concludes also, and most correctly, that this conic proportion is most obvious, increases most rapidly, and spreads with its broadest base in infants, or rather in the fœtus; for here the main trunks of the arteries are extremely short, while the capillaries are very large, and from the obliteration of many vessels in subsequent life, more numerous than at any other period. It is highly probable, indeed, that while the aorta in childhood is not a fourth part of the size of the same vessel in an adult, the aggregate of the capillaries of the former possesses a diameter more than four times as large as the aorta in the latter.

We may hence, in some degree, account for the difference in the quickness of the pulse at different periods of life. In early infancy it beats as much as 140 strokes in a minute; towards the end of the second year it is reduced to 100; at puberty it is only 80; about virility 75; and after sixty years of age seldom more than 60 in a minute. For reasons connected with the preceding, it is more frequent in persons of short stature, those of strong passions of mind, those of great muscular exertion, and in females. From the increasing diameter of the bloodvessels as they diverge from the heart, the blood has a greater space for moving forward, and is able to move with more freedom; and hence one reason for the empty state in which the arteries are found immediately after death: a second reason is, that the tunics of the veins, possessing little or no elasticity, readily dilate to the distentive power of the blood as it moves forward: a third, and indeed the principal reason, as sufficiently proved by Dr. Carson, is the natural elasticity or resilience of the lungs, which, by keeping them after death in a state of dilatation, allows the blood to accumulate here as in the vacuum. And hence, again, the reason of the accumulation of blood, which is usually found in the chest after death, as well as the empty state of the vessels.

This vacuity of the arteries after death was one of the objections urged very forcibly by the ancients against the circulation of the blood, or even its following at all the course of the arteries; and which Dr. Harvey very unsatisfactorily replied to, by asserting, contrary, indeed, to fact, that the heart continues to contract for some time after death, and even after it has received blood; for it is generally found loaded with blood.—(*Carson "On the Vacuity of the Arteries after Death;" Med. Chir. Trans.*, vol xi., part i.)

The pulmonary artery, which receives from the heart the blood returned into it from the veins, bears a very close proportion to the diameter of the aorta (*Hunter*, p. 133), which sends the blood from the heart over the whole of the larger circulation. The aorta possesses more strength, but their elasticity is nearly equal, and the measure of each, on being slit, is about 3¼ inches: and hence there can be little doubt, that the quantity of blood sent back to the heart is on an exact balance with that which flows from it. It is not, however, at any time the identical blood, which is thus returned to the heart; for every organ takes from the general current, as it visits it, such parts and such principles as it stands in need of to support the wear and tear of its own action; while another considerable portion is thrown off, as we have already observed, in the form of secretions or exhalations, from various emunctories that open externally or into internal cavities. But the drain which is hereby produced on the arterial blood, is compensated by the various fluids collected from every part by the absorbent vessels, and by the flow of the chyle from the digestive organs; both which are poured into the thoracic duct, and finally intermixed with the returning current of venous blood a short time before it reaches the heart; and, in this manner, the balance of arterial and venous blood is maintained.

With respect to the actual quantity of blood contained in the entire system, our means of determination are so inexact, and consequently the calculations, or rather the conjectures, that have been offered upon the subject, are so strikingly discrepant, that it is not easy to reach a satisfactory conclusion. It is only necessary to state a few of the different opinions that have been offered, to show the absurdity of several of them. Muller and Abeildgaard estimate the weight, even in an adult, at very little more than eight pounds (*Blumenb. Elem. Phys.*, p. iv., sect. 6); Borelli at twenty; Planch at twenty-eight; Haller at thirty; Dr. Young at forty (*Phil. Trans.*, 1809, p. 5.); Hamberger at eighty; and Keil at one hundred. Blumenbach states the proportion in an adult healthy man to be as 1 to 5 of the entire weight of the body. Yet, little reliance can be placed on this last mode of determination, on account of the great diversity, in point of bulk and weight, of adults, whose aggregate quantity of blood is in all probability nearly alike. The mean numbers, as those of Baron Haller and Dr. Young,

secretion take place through the thin coats of the vessels.—Ed.

making the amount from 30lb. to 40lb., appear most reasonable; and, perhaps, fall not far short of the sum intended by Blumenbach. The subject requires further examination, and a nicer estimate.

II. There is another question, which has also, in all ages, greatly occupied the attention of physiologists, but upon which we still remain in a very considerable degreee of indecision; and that is, the MOVING POWERS employed in the circulation; or, in other words, the projectile force by which the blood is sent forward.*

[Harvey, Haller, Spallanzani, Legallois, Parry, and Magendie maintain, that *the sole moving power of the blood is the action of the heart.* Pecquet, Bartholine, Bohn, Senac, Verschuir, Zimmermann, John Hunter, Blumenbach, Sœmmerring, Langenbeck, Tiedemann, Béclard, Sir E. Home, Dr. Hastings, and Dr. W. Philip infer from their researches, that *the circulation does not depend on the heart alone, but is also supported by muscular contraction of the arteries.* Darwin, Bichat, Richerand, and probably Meckel, deny that the greater arteries possess vital contractility, or contribute to the propulsion of the blood, but assign to the smaller arteries and capillary vessels *a vital contractility, through means of which the blood is first attracted, and then propelled, and ascribe to the circulation in them a nearly complete independence of the influence of the heart.* Others, as Carus, Treviranus, Döllinger, and Oesterrheicher, are led by their inquiries to believe, that neither the larger arteries, nor the capillary vessels, contribute by their contractions to the progress of the blood; but, that *the blood moves chiefly through means of its vitality, or an inherent power of motion,* and that its movement, as thus effected, is materially supported by the action of the heart alone.*]

The heart forms the salient point of motion, and with its systole or contraction the circulation commences. But what is it that excites the heart to contract? One of the most common answers to this question, in the writings of physiologists, is, the flow of the blood into the ventricles. But this is merely to argue in a circle; for the question still returns, what is it that makes the blood flow into the ventricles? Others have referred the cause to an immediate impulse from the brain. Now, in contractions of the voluntary muscles, there is no doubt of the existence of such an impulse, for we are conscious of it, and assent to it; but we are neither conscious of, nor assent to, any thing of the kind in respect to the contraction of the heart; and are perfectly sure that no such power of the will takes place during sleep. It is a mere assumption; and an assumption which can only apply to a part of the great animal kingdom, even during wakefulness; for, as it is only in mammals and birds that the nerves can be thus influenced in their passage to the heart, the postulate does not account for the contraction or dilatation of the heart in other classes of animals.

Mr. John Hunter ascribes this action of the heart, or rather the whole career of the circulation, of which he regards the action of the heart as a single and ordinary link in the general chain, to what he calls a stimulus of necessity; by which he seems to mean, an instinctive power, dependant on the general sympathy of the system, which in every part is craving or demanding such an alteration; or, in other terms, is uneasy without it. His words are as follow:—"The alternate contraction and relaxation of the heart constitutes a part of the circulation; and the whole takes place in consequence of the necessity, the constitution demanding it, and becoming the stimulus. It is rather, therefore, the want of repletion, which makes a negative impression on the constitu-

* In the Am. Journal of Med. Sciences, No. 22, p. 348, Dr. Robinson, of Petersburg, Va., has recorded an interesting case of malformation, which may throw additional light on the action of the heart. In a newborn and full-grown infant, the two clavicles, the sternum, and the costal cartilages were deficient; and the cavity of the thorax was exposed to view. The pericardium was absent, and the motions of the heart were observed for fifteen or twenty minutes; this organ was then removed from its attachments, opened, and thrown into a basin of cold water. It however still continued to beat, with less force, but with perfect regularity. The conclusions drawn by Dr. R., from seeing and touching the heart, are as follow:—"Systole and diastole are the natural muscular actions of the heart. The force of the diastole is equal to, if not greater than, the force of the systole. There is no pause between auricle and ventricle, either in diastole or systole: the action passing from base to apex with great velocity; *perhaps* accelerated, *certainly not* retarded. There is not only no pause between the diastole and systole, but the latter almost seems to appear before the former vanishes: thus presenting the appearance of one compound action, in which all the parts concerned co-operate perfectly. The diastole always precedes the systole in the natural order of action. Similar actions in similar parts of the different sides are always synchronous. The time of action, including systole and diastole, is less than the time of the pause. The pause succeeds the systole of the organ. The impulse of the apex against the side of the thorax is caused by the diastole of the auricles, especially the left; for, as the distance of the axis of the heart from the diaphragm must be increased by the increase of its transverse diameter in diastole, and as it is firmly tied down at its base, this increase of distance of the axis can be effected only by its turning on the distended auricle—as each action of the heart is performed by a convulsive jerk, the force of the impulse is naturally accounted for. There is in the heart a vis insita, or vis propria: this is demonstrated by its perseverance in action so long, after its entire separation from all influence of the brain, nerves, and ganglions."—D.

* See Wedemeyer's Untersuchungen über den Kreislauf des Bluts, &c., Hanover, 1828; and Edinb. Med. and Surgical Journ., No. c., July, 1829, in which a detail of the contents of Wedemeyer's treatise will be found; the first part of which treats of the part performed by the greater arteries in the circulation; the second, of the movement of the blood in the minute arteries and capillaries; the third, of the movement of the blood independently of mechanical actions; and the fourth, of the phenomena of capillary attraction in the animal system.—ED.

tion, which becomes the stimulus, than the immediate impression of something applied to the heart. This we see to be the case, wherever a constant supply, or some kind of aid, is wanted in consequence of some action. We have as regularly the stimulus for respiration, the moment one is finished an immediate demand taking place; and if prevented, as this action is under the influence of the will, the stimulus of want is increased. We have the stimulus of want of food, which takes place regularly in health, and so it is with the circulation. The heart, we find, can rest one stroke, but the constitution feels it; even the mind and heart are thereby stimulated to action. The constant want in the constitution of this action in the heart, is as much as the constant action of the spring of a clock is to its pendulum, all hanging or depending on each other."—(*On Blood*, p. 149.)

Mr. Hunter's "Treatise on the Blood" is a work of such sterling merit, so rich in its facts, and so valuable in its remarks, that, notwithstanding a few nice-spun and chimerical speculations that occasionally bewilder it, there is no book on physiology which a student ought to study more assiduously. Yet I am much afraid, that the language now read has no great deal of meaning in it; and that it does little more than tell us, that the heart contracts because it contracts, or, rather, that the circulation takes place because it takes place.

Few physiologists indeed seem to have adopted this opinion: and hence a far more plausible and intelligible hypothesis has been since offered. This consists in supposing the heart to be stimulated by the oxygen of the blood introduced into it in the lungs by the process of respiration. Such was the favourite opinion of Dr. Darwin; and such appears to have been the opinion of Blumenbach, who was so fully persuaded of the oxygenized state of the blood when first received by the heart and poured into the arteries, that he expresses a desire of changing the terms *arterial* and *venous* blood for *oxygenized* and *carbonized*.

That oxygen, if introduced into the blood, would stimulate the heart, there can be no doubt, from numerous experiments which prove that a very small quantity of any foreign body whatever, even an ounce or two of solution of gumarabic, infused into the blood by opening a vein, will not only stimulate the heart, but the stomach, intestinal canal, and other organs, with which the heart readily sympathizes.—(*De Chirurgiâ Infusoriâ renovendâ. Aut. J. M. Regnaudot*, 8vo., Lugd. Bat., 1779.) [Whether the gumarabic thus injected into the veins would stimulate the preceding viscera, requires proof; but various experiments of M. Magendie show, that it would produce death on another principle; namely, that of obstructing the capillary circulation in the lungs. The hypothesis of Darwin is refuted by the fact, that it would at all events only account for the contraction of the left cavities of the heart; since those of the right side, which perform their contractile functions perfectly well, receive blood that has not undergone the oxygenating change of respiration. Mr. Brodie found in his experiments on rabbits, that the heart continued unaltered for at least two minutes after that viscus and the great bloodvessels were empty of blood; and hence he concluded, that its action does not depend upon the presence of the blood in its cavities.—(See *Cook on Nervous Diseases, Introd.*, p. 61.) It should also be recollected, that if the contact of the blood were necessarily followed by the contraction of the heart, this organ would never be relaxed, because, though the quantity of that fluid undoubtedly varies at different moments in the auricles and ventricles, it is difficult to suppose that they are ever free from it. Senac's doctrine, that the contraction of the heart is caused by the stimulus of the distention of the blood, is also one that cannot now be retained.]

But passing by, till this question is settled, the doctrine of the primum mobile, or first moving power of the blood from the heart—by what means is the motion, thus mysteriously commenced, maintained afterward through the whole circulatory course? Harvey replied to this question by asserting, that it is maintained by the action of the heart alone, which propels the blood equally through the entire length of the arteries and veins, both which he regarded as tubes alike inert, and in no respect contributing to the propulsive energy.

This dictum was at first received with universal assent; and the mechanical physiologists immediately set to work, in order to calculate the force with which the heart acts at every contraction, in the same manner as they had endeavoured to calculate the force of the stomach in the process of digestion. It is not necessary to enter into the detail of these estimates. It is sufficient to observe, that, from Michelot to Sauvages, or Cheselden, they all differed from each other as widely as in calculating the quantity of blood in the system; and that, while Keil estimated the projectile power of the heart at five ounces, and Hales at fifty-one pounds and a half, Borelli fixed it at no less than one hundred and eighty thousand pounds.*

There are various facts, however (and several have been already mentioned in the course of this proem), which sufficiently prove, that the heart cannot be the sole propulsive power through the entire range of the circulation. The two following are also much insisted upon: Firstly, that the pulse, if the systole of the heart were the only projectile force, must take place, not SYNCHRONOUSLY all over the system, as it is well known to do, except in a few morbid cases in which local causes interfere, but SUBSEQUENTLY to the contraction of the heart, and SUCCESSIVELY through the whole line of the arterial tubes, in proportion as they lie more

* For some valuable matter on this point, see the Researches of J. L. M. Poiseuille on the Force of the Aortal, or Left Side of the Heart, in Breschet's Répertoire Gén. d'Anat., &c. 3me trimestre de 1828; or, the translation in Edinb Med. and Surg. Journ., No. for July, 1829, p. 28.—Ed.

remove from the salient point.* And, secondly, that whatever may be the projectile power of the heart, it must altogether cease with the arteries, and cannot reach the veins.

And hence arose another hypothesis, which ascribed the propulsive power to a progressive *vis a tergo*, or a force communicated from the ventricles of the heart to the commencement of the arteries, producing a vibration or alternate dilatation and contraction of their tunics through their whole length to the veins; and thus acting in conjunction with the projectile force of the heart itself.

In proof of this auxiliary power afforded by the coats of the arteries, the phenomenon of pulsation was triumphantly appealed to; which, it was maintained, gave a direct and incontrovertible evidence, that an alternate dilatation and contraction, or enlargement and diminution in the diameter of the arteries, is constantly taking place. This, by Bichat, is attributed solely to the locomotion of the arterial tubes, propagated to their terminal ramifications, and thence continued to the veins; but, by most modern physiologists, to a joint power, compounded of the action of the heart and the arteries.

Bichat's doctrine has of late been incontrovertibly refuted by one or two very simple experiments of M. Magendie.—(*Physiologie*, tom. ii., p. 320.) Besides which, however, it is now a well-ascertained fact, and one that has been thoroughly elucidated by Dr. Parry of Bath (*Exp. Inq. into the Nature, Cause, and Varieties of the Arterial Pulse*, &c., Bath, 1816), that no increase of size, or indeed change of bulk of any kind, takes place in arteries during either the systole or diastole of the heart's ventricles in a state of health. The arteries of animals, to ascertain this point, have been exposed in different parts, and to considerable lengths, without evincing the least apparent increase of size. And hence it is the pressure of the finger, or of some other substance against the side of an artery that alone occasions pulsation, in consequence of the resistance hereby made to the regular flow of the blood; the alternating beat being produced by the greater momentum with which the current strikes against the finger or other cause of obstruction during the systole, than during the diastole of the heart.

Döllinger confirmed Parry's experiments by laying bare the carotid of a dog before his pupils, which gave to the eye no proof of altered form or motion, though a pulse was distinctly felt by the finger. And, in like manner, a pulsatory motion is always felt by the fingers when applied to a leaden water-pipe while a pump is at work upon it at one end, and alternately giving a fresh pressure to the column of water it contains by forcing in a fresh supply: yet the pipe is all this time incompressible.

[Sir David Barry plunged his arm into a horse's chest, and found the aorta constantly full, without any variation of its distention for an instant, though he took hold of it for five minutes, and repeated the experiment. On the other hand, the vena cava was so little distended that it felt like a thin flaccid membrane. (*Dissert. sur le Passage du Sang à travers le Cœur*, p. 78, Paris, 1827.)]

In inflammation, the pulse of the inflamed part in consequence of local excitement is much more frequent than that of the heart or of any other organ. Thus, in a whitlow, the radial artery may give to the finger a hundred pulsations in a minute, while not more than seventy strokes may be exhibited in any other part of the system. The rapidity of the pulse is in this case usually in proportion to the degree of the inflammatory action (*Exp. of the Prin. of Pathology*, &c., by Daniel Pring, M. D., p. 119, 8vo., 1823): and hence, if the system should labour at the same time under ten different inflammations in different parts or organs of a different structure, as glands, muscles, and membranes, it is possible that it may have so many different seats of pulsation taking place at such different parts at one and the same time, while all of them are at variance with the pulsation of the heart. Even where there is no inflammation, such discrepances in the pulse are occasionally to be met with, insomuch that Riel gives a case in which the heart, the carotids, and the radial arteries all pulsated differently (*Memorabilia Clinica*, vol. ii., fascic. 1–6, Hall., 1792); and we can hence readily perceive why they should be more frequent and striking under the increased action produced by inflammation, and often, in a debilitated organ, more disposed to irregular action, and particularly irregular contractile action, in its capillaries.

[Respecting the correctness of the statement, that the pulsations of inflamed parts are often more numerous and frequent than those of the rest of the system, the editor has never seen a case in confirmation of it; and were not the thing asserted by so many men of eminence, he should be inclined to set it down as erroneous. In whitlows, and other cases, the arteries leading to the part affected throb with increased force; but never, as far as the editor's observations reach, with a quickness exceeding that of the action of the heart However, if the statement made by writers be accurate, physiologists need no longer doubt and dispute about the muscularity of arteries and even of those which cannot be regarded as capillaries, to which all physiologists impute a contractile power under some name or another.]

We are let a little into the mystery of the above-mentioned phenomenon by the curious fact, that some of the arteries possess a higher degree of contractile power than others, and that *the capillaries possess the highest measure allotted to any of them.* "Indeed, every fact," observes Dr. Bostock (*Physiology*, vol. i., p. 402), "with which we are acquainted, respecting the mechanism and functions of the sanguiferous system, leads us to the same conclusion, that the large arteries are to be regarded as canals transmitting the blood from the heart,

* This is still maintained to be the fact by M. Poiseuille, as will be presently noticed.—Ed.

where it receives its great impulse, into the smaller branches; and that it is chiefly in these smaller branches that it exercises its various functions." We may hence see why the capillaries are, in many cases, so much sooner excited than the larger canals, and exhibit so much more violence of action: a distinction of high importance in explaining the doctrine of inflammation, though it has been less attended to by pathologists than it deserves.

The hypothesis, therefore, of a *vis à tergo*, whether dependant upon the heart alone, upon the arteries alone, or upon a combination of the two, has by no means proved sufficiently satisfactory, or been sufficiently supported by evidence in respect to the entire circulation. Under no modification does it account for the flow of the blood through the veins. And in regard to the whole of the views which have been thus far examined, Mr. John Hunter, as I have already observed, was so extremely discontented, that he placed no more stress upon one part or organ of the sanguiferous system than upon another; upon the heart than upon the arteries; or upon the arteries than upon the veins; regarding the whole economy as the result of a sort of instinct, to which, as just noticed, he gave the name of a stimulus of necessity; and which opinion he supported by making an appeal to insects which had no proper heart; to worms, most of which have no heart whatever; and to monsters which have been born without a heart; while at the same time he contended that veins, at least the larger, exhibit, under certain circumstances, an expansile and contractile power as well as arteries. "I think it probable," says he (p. 187), "that where there is a universal action of the vascular system, the action of the arteries and veins is alternate: that where the arteries contract, as in many fevers, the veins rather dilate, more especially the larger." And it is hence again highly probable, that in this "universal action of the vascular system," the secerments, or extreme arteries, take an important part; and not impossible, though the thing needs proof that they operate, as has been suggested by Dr. Pring,* by a kind of suction, which may be regarded as a *vis à fronte*.

Upon the whole, we may conclude with Haller, that the heart exerts a very considerable degree of force in the general economy of the circulation, although it is impossible to estimate its power with mathematical precision. And we may reasonably refer the first or arterial half of the general circuit of the blood to this force, if not alone, in conjunction with the aid contributed by the elastic and contractile tunics of the arteries themselves, whether pulsation be a result of these powers alternately exercised, or of mere local pressure.*

It yet remains, however, to account for the second half, or that which consists in the passage of the blood through the veins; and upon this subject, there is one most important and elucidating fact, which, till of late, has never been in any degree brought forward in the course of the inquiry. It is this: that when the heart, by the contraction of its ventricles, has exhausted itself of the blood contained within it, a comparative vacuum must follow, and the blood from the venæ cavæ, or venous system at large, be sucked up into the right auricle.† This ingenious remark seems first to have been thrown out by Dr. Wilson Philip (*Inquiry, &c.*, p. 9, &c.): and Dr. Carson, of Liverpool, taking advantage of it, has constructed a simple and beautiful theory of the projectile powers employed in the circulation, the general principle of which may be expressed in a few words. The heart is supposed to act at one and the same time in a twofold capacity. By the contraction of the ventricles, it propels the blood

* Ubi suprà, p. 132, 165. With respect to Bichat's doctrine, that the impulsive power of the heart is almost nugatory in relation to the blood in the capillaries, Dr. Wedemeyer does not admit its correctness, observing, that the transmission of the heart's impulse, even to the extreme capillaries, may be inferred from the slight force required to impel water, a solution of indigo, or fresh drawn blood, through them with a syringe, even from a large artery; a force certainly inferior to that with which the blood in the same artery flows through it under the action of the heart during life. This statement, as an able critic has remarked, receives corroboration from the late discovery of M. Poiseuille, of Paris, that each molecule of blood retains the force it received from the heart, even after it has passed through a long course, and through many subdivisions of the arterial system.—(Edinb. Med. Journ., No. c., p. 88.) That the impulse of the heart extends even to the capillaries is further shown by the effects of depletion, or of fainting, on sanguinolent secretions, on redundant secretions, and on hemorrhage.—Ed.

* It would appear from Dr. Poiseuille's experiments, that the force with which a molecule of blood moves in the carotid or in the aorta, is precisely the same with the force of its movements in the smallest arterial branches: or, in other terms, that a molecule of blood moves with the same force throughout the whole arterial system: "a fact," says this author, "which I was far from anticipating. It is not easy to account for the uniformity here unfolded. When the heart contracts, a wave of blood is pushed into the arterial system, already full of blood. The phenomena that ensue are dilatation of the arteries, and a kind of locomotion of the arterial system, by which its curvatures tend to straighten themselves. These changes cannot take place except at the expense of the force with which the wave is propelled from the heart. But hardly has the arterial system become dilated, and scarcely have its curvatures yielded to the action of the heart, when the arteries, through the elasticity of their coats, contract again, and restore to the force of the blood all the loss it had sustained. In this way, perhaps, we may explain how the intensity of the force communicated to the blood by the heart, is preserved (as the experiments referred to show), even to the last arterial ramifications."—See Edinb. Med. and Surg. Journ. for July, 1829, or Breschet's Répertoire Gén. d'Anat., &c., 1828.

† Bichat and Dr. Bostock deny the existence of this suction-power, which, however, has Wedemeyer in its favour, who conceives that the heart has the power of promoting the capillary circulation, though only in a feeble degree, by the suction-power of its *auricular cavities*, or the blood in the veins.—Ed.

through the arteries; and by the dilatation of the auricles, it draws it up from the veins. It is at once, therefore, a forcing and a suction pump. The contraction of the heart, and consequently its comparative vacuum, are supposed to be considerably assisted by the elasticity of the lungs, and the play of the diaphragm, which we had occasion to notice at some length in our physiological proem to the preceding class, and the great resistance which they jointly afford to the atmospheric pressure; while this very pressure, applied on every part of the exterior of the animal frame, contributes in an equal degree to the ascent of the blood in the veins; for as the column of venous blood is perpetually girt on all sides, and cannot fall back because of the numerous valves with which the veins are furnished, it must necessarily take an opposite or ascending direction.

A suction power, however, as existing in any part of the heart, has been positively denied by Sir David Barry; whose hypothesis transferred it from the ventricles of this organ to the cavity of the thorax, or rather to the great veins contained within such cavity. The grand cause of the venous part of the circulation is, with him, "atmospheric pressure, diminished, or entirely taken off, around the cardiac ends of the venous tubes, during the expansion of the chest, but unaltered and entire around every other part of their surface, opposed only by the gravity of the fluid acted upon." He has, indeed, sufficiently shown, by a multitude of experiments, that the suction operation of the great veins is precisely coincident with the instant, in which the animal experimented upon endeavours to form a vacuum in the chest: that the black blood passes through the veins only during the act and time of inspiration; and that this venous movement is always placed under the influence of atmospheric pressure. There can hence be no doubt that the action of the atmosphere upon the cavity of the chest during the alternating process of inspiration and expiration, exercises a much more powerful effect upon the circulating system than has hitherto been taken into the account. But as the pulsation of the heart and arteries may be made to continue with regularity, even in mammalian animals, by a forced quiescence of the lungs, for sixty or eighty strokes in succession, in divers for half an hour, and in syncope for a much longer period of time; and as a like circle of action is found to prevail in animals below this rank, as in fishes and reptiles, whose mode of respiration is different, and does not allow of the same thoracic suction power, Sir David Barry seems to have overrated the assistance which the venous circulation derives from this quarter, in concluding, that of all the contributing forces, "the pressure of the atmosphere is by far the most intense in its degree, the most constant in its influence, and the most unvarying in its amount: that, without which, the circulation could not be maintained beyond a few moments."—(*Experimental Researches*, &c., p. 58, 8vo.) It is well observed by Dr. Bostock, that in the healthy state of the system, we respire, upon the average, about twenty times in a minute, while the average velocity of the pulse may be estimated at eighty, so that the heart contracts *four times during each act of respiration*; and must consequently receive the blood during all the various states of distention to which the lungs are subject; yet we do not perceive that the pulse exhibits any corresponding variations, either in its strength or its velocity. And further, we shall find it very difficult to produce any effect upon the pulse by the most powerful voluntary efforts of inspiration or expiration; yet, in such cases, the capacity of the thorax will certainly undergo a much greater change than it can possibly experience in its ordinary action.*

There are, nevertheless, numerous difficulties that yet remain to be explained; such as the proportion of projectile power furnished by the conducting pipes themselves; by what means the want of a diaphragm is compensated in birds and reptiles which have no such organ; what constitutes the projectile power in animals that have no heart, and consequently no double pump to work with;† [the mode of contraction

* Elementary System of Physiology, vol. ii., p. 56, 8vo., 1826.—The above observations on Sir David Barry's theory were lately found among Dr. Good's papers, and would have been inserted in the last edition of this work, had they been put into the editor's hands early enough for the purpose. Wedemeyer infers from an experiment made on a horse, the particulars of which are given in the Edinb. Med. Journ., No. c., p. 89, that, in the natural state of the breathing, the suction-power must be very insignificant, which, according to Sir David Barry's researches, is exerted upon the venous blood by inspiration. Wedemeyer objects to that author's statements, 1. That the tendency to a vacuum in the chest during inspiration must be completely overcome by the entrance of the air, an elastic mobile fluid, before any material suction-power can be exerted on a heavy inelastic liquid, such as the blood. 2. That the afflux of blood in a tube towards the jugular vein of the horse, was observed by Sir David Barry to correspond with inspiration only when the animal was lying, and consequently breathing with unnatural force with one side only of the chest; and that, in the erect posture, no such correspondence is to be observed, unless the animal be excited to violent respiration. 3. That the tendency to a vacuum in the chest cannot account for the movement of the blood in the pulmonary veins, which are subjected outwardly to the same power which is supposed to act on the blood within them. 4. That the venous circulation may be kept up in the mammalia by artificial breathing, for twenty-five minutes or longer after decapitation, although, in such circumstances, the chest internally is constantly subjected to pressure; and that in frogs and other cold-blooded animals, the venous circulation will continue for hours, after the breathing has been annihilated by laying open the chest. 5. That the venous circulation goes on in the fœtus, and in many of the lower animals, without any respiratory movements whatsoever. These objections, along with what has been advanced by Dr. Arnott on the subject, seem to an able critic to render the supposed discovery of Sir David Barry exceedingly doubtful. Vid. Edinb. Med. Journ., No. cc.; and Wedemeyer's Untersuchungen über den Kreislauf des Bluts, 1828.—Ed.

† Diatribe Anatomico-Physiologica de Structurâ

in the vessels; since, as there are no valves in the arteries, if the contraction be supposed to take place simultaneously in their whole course, it may appear to some physiologists as likely to have a tendency to propel the blood backwards or forwards. Indeed, Bichat avails himself of the fact, that the arteries have no valves, to strengthen his position, that these tubes cannot be muscular.]

There is also another curious fact, which physiology has pointed out, but has never hitherto been able to explain; and that is, a direct communication between remote or unconnected organs, apparently, by some other channel than the circulation of the blood. Something of this kind seems to exist between the spleen and the stomach, the former of which has been proved by Sir Everard Home to receive fluids from the cardiac portion of the latter, though we can trace no intercourse of vessels: but the most extraordinary example of this kind which at present we seem to possess, is, the communication which exists between the stomach and the bladder. For the experiments of Sir Everard Home, (*Phil. Trans.*, 1811, p. 163), and the still more decisive ones of Dr. Wollaston and Dr. Marcet, (Ibid., p. 96), seem to have established beyond a controversy, that certain substances introduced into the stomach, as rhubarb, or prussiate of potash, may pass into the bladder without taking the course of the bloodvessels, and consequently by some other channel; a channel, indeed, of which we know nothing.* This is a subject well worth studying: for if two organs, so remotely situated as the stomach and the bladder, be thus capable of maintaining a peculiar intercourse, so other organs may possess a like intercommunion; and, by such means, lay a foundation for those numerous sympathies between distant parts which so often strike and astonish us. M. Magendie's hypothesis, that veins are absorbents, may explain the facts in Sir Everard Home's experiments, but has no bearing upon that of Dr. Wollaston and Dr. Marcet.

The discovery of the circulation of the blood has given a great importance to the DOCTRINE OF PULSATION; for by the strength or weakness, the slowness or frequency, the hardness or softness, the freedom or oppression, the regularity or irregularity of the beat of the artery against the pressure of the finger, we are now able to determine many momentous facts, relative, not merely to the state of the heart, but of the general system; and, in many cases, to prognosticate upon grounds which were altogether unknown to the earlier cultivators of medicine. And on this account it is, that the Greek physicians took but little notice of the pulse, which, even in the days of Celsus, was regarded as a *res fallacissima*.

The pulse is influenced indirectly by the general state of the body, but directly by that of the heart, or of the arteries, or of both, or of the quantity of blood which the vessels have to contain.

In an adult male of good health, and not too corpulent, the common standard of the pulse may be fixed at seventy strokes in a minute; but it varies in different individuals from sixty to eighty, being greatly affected by the temperament, and partly by the habit of life. In the man of a high sanguine character it rarely sinks below eighty, and is often at ninety; and in the melancholic, it seldom rises above sixty, and sometimes sinks to forty. In some idiosyncrasies the discrepance is so considerable, and complicated with other changes than those of frequency and tardiness, that there is no reducing them to any rule. Sir John Floyer, who has numerous bright openings in the midst of a generally obscure horizon, set down the standard number of pulses in health at seventy-five, and affirms that they cease altogether at forty, and are followed by a loss of all sense and motion.—(*The Physician's Pulse-Watch*, &c., 2 vols., 8vo., Lond., 1707.)

Lizarri tells us, however, of a person whose pulse was not more than ten beats in a minute. —(*Raccolta d'Opusculi Scientifici*, p. 265.) Dr. Heberden says, he once saw a person whose pulse, as he was told, did not number in the beginning of his illness above twelve or sixteen in a minute; though he suspects, in this and all other instances, where it is below forty, that the artery beats oftener than it can be felt; because such low pulses are usually unequal in their strength, and some of the beats are so faint as but just to be perceived; so that others, probably still fainter, are too weak to make a sensible impression on the finger. He had attended two patients, who, in the best health, had always very unequal pulses, as well in their strength as in the spaces between them, but which constantly became regular as the patient grew ill, and gave a never failing sign of recovery in their once more returning to a state of irregularity.—(*Med. Trans.*, vol. ii., art. ii., p. 29.) In women the pulse is, generally speaking, six or eight strokes in a minute quicker than in men, and hence, many women, of firm health and a lively disposition, have a standard pulse of eighty-five.

In a weakly frame, the pulse is usually rapid; for debility is almost always accompanied with irritability, and the heart partakes of the general infirmity. In this case, also, from the feebleness with which the heart contracts, the ventricle is but imperfectly emptied, and consequently sooner filled again, and sooner stimulated to contraction. Hence, in infancy, the pulse is peculiarly quick, and gradually becomes slower as the child increases in strength. Dr. Heberden, who paid particular attention to this subject, estimates the pulse on the day of his

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atque Vitâ Venarum: à Medicorum ordine Heidelburgensi præmio proposito ornata.—Auctore Henrico Marx, 8vo., Carlsrhue, 1822.

* In some particulars of a remarkable and perhaps quite unique case of tæniæ, voided from the meatus urinarius, it is stated by Mr. Law, of Penrith, who attended the patient, that the turpentine which she took by the mouth found its way into the bladder in twenty seconds. The letter mentioning this curious fact, was shown to the editor by his friend, Mr. Docker, late of Canterbury.—ED.

birth, and while asleep, from a hundred and thirty to a hundred and forty; and fixes it at little less than the same rate, or that of a hundred and twenty strokes, for the first month. During the first year he calculates it at from a hundred and twenty to a hundred and eight; during the second, at from a hundred to ninety; during the third, from a hundred and eight to eighty, at which it continues for the three ensuing years. In the seventh year it is frequently reduced to seventy-two; and in the twelfth, to seventy.—(*Med. Trans.*, vol. ii., art. ii., p. 29.) In advanced age, the pulse sinks often considerably below sixty strokes in a minute. "I knew one," says Dr. Heberden, "whose chief distemper was the age of fourscore, in whom, for the last two years of his life, I only once counted so many as forty-two pulsations; but they were seldom above thirty, and sometimes not more than twenty-six. And though he seemed heavy and torpid, yet he could go out in a carriage, and walk about his garden, receive company, and eat with a tolerable appetite."

I have at this moment under my care a case of still greater anomaly, in which the pulse is never more than thirty, and more commonly, even after walking, not more then twenty-seven strokes in a minute. Mr. Alexander, the patient I refer to, is sixty-five years of age. About six years ago, from the bursting of a pipe for the conveyance of coal-gas, he fell down in a fit of asphyxy, from which he revived with great difficulty. The reducing plan was carried too far, and, though he has recovered from the accident, and his head is uniformly clear, he is dyspeptic, and subject to palpitations of the heart. [In September, 1828, a gentleman, named Paine, was confined in the Fleet prison, whose pulse was sometimes as low as thirty, and hardly ever above forty: he suffered a good deal from asthma.]

The pulse may be counted with great accuracy up to a hundred and forty or a hundred and fifty in a minute; and if the stroke be equal, and the wrist slender, so that we can take in more than half the artery by the pressure of two fingers, we can reach a hundred and eighty; Professor Frank gives an instance of two hundred (*De Cur. Hom. Morb. Epit.*, tom. ii., p. 175, 8vo., Manheim, 1792), in a case of complicated carditis; but, beyond this, there is great confusion and uncertainty; and it is difficult, therefore, to understand by what nice mode of measurement Dr. Wendt could distinguish, as he tells us he has done, a pulse of two hundred and forty-three strokes in a minute.—(*De Mutatione quâdam Pulsûs insigni*, Erlang., 1778; V. Bald. Syll. v.) Sir John Floyer (Op. cit.) sets down a hundred and forty as the amount of "as many pulses as can be counted."

The pulse is quickened by very slight excitements, both external and internal. The stimulus of the air, of the light, and of sounds, is sufficient to make that of an infant awake fifteen or twenty strokes more frequent than when it is asleep, and beyond their control. The pulse of an adult is usually quickened eight or ten strokes during the digestion of a meal; and running, or any sudden and rapturous emotion of the mind, will double the ordinary scale. The depressing passions, on the contrary, check it, and have sometimes put a total stop to the heart's motion, with a deadly shock, and killed the patient in a moment. There are many drugs that have a like tendency, of which all the simple narcotic poisons afford examples. The digitalis and hyoscyamus are expressly used on account of this property: the prussic acid, and the plants that contain it, as bitter almonds and the leaves of the *prunus laurocerasus*, when given in free doses, destroy the irritability, and extinguish the pulse instantly; and this so effectually that the heart, when immediately examined, has been insensible, not only to puncture, but to concentrated acids.

As the excitement of the stomach during the natural process of digestion is capable of accelerating the pulse eight or ten strokes in a minute, there can be no difficulty in conceiving, that it may be still more accelerated by a morbid excitement of any other large organ, and particularly where the primary seat of excitement is in the sanguiferous system itself. And as, generally speaking, the frequency of the beat is in proportion to the degree of excitement, the pulse becomes a sort of nosometer, or measurer of the violence and danger of the disease: and it measures it equally, whether the return of the beat be below the standard of health or above it.

How far, in either case, the pulse may vary from its natural number without great danger, depends upon a multitude of collateral circumstances, as the age of the patient, his idiosyncrasy, the peculiar disease he is labouring under, and the strength or weakness of the system. And hence, in addition to the number of the pulse, we should also attend to its degree of fulness, softness, firmness, freedom, and regularity; a critical knowledge of which can only be learned by experience and a nice discrimination.

It has been highly injurious, however, to the study of medicine, that this subject has been often too finely elaborated, and the variations of the pulse been ramified into so many divisions and subdivisions, and nice unnecessary distinctions, as to puzzle the young and be of no use to the old. And hence, some of the best pathologists of modern times have been too much disposed to shake off nearly the whole of the encumbrance, and pay no attention whatever to the pulse except in regard to its frequency. Among this number was Dr. Heberden:—"Such minute distinctions of the several pulses," says he (*Med. Trans.*, vol. ii., p. 20), "exist chiefly in the imagination of the makers, or, at least, have little place in the knowledge and cure of diseases. Time, indeed, has so fully set them aside, that most of these names of pulses are now as unheard of in practice as if they had never been given." And in forming, therefore, his prognostic of a disease, while he appeals to the pulse merely in respect to its number, he draws his other grounds of decision from the nature of the malady, and the violence of its specific signs.

But this is to limit the subject to too strict a

boundary; and to exclude ourselves from what, in many instances, are clear and even leading diagnostics. There are some practitioners, and of very high merit too, whose fingers are no more capable of catching the finer distinctions of the pulse, than the ears of other persons are the niceties of musical sounds. I suspect this was the case with Dr. Heberden, as it was also with the late Dr. Hunter; of whom Mr. John Hunter observes, that, "though he was extremely accurate in most things, he could never feel that nice distinction in the pulse that many others did, and was ready to suspect more nicety of discrimination than can really be found. Frequency of pulsation in a given time is measurable by instruments; smartness or quickness in the stroke, with a pause, is measurable by the touch, but the nicer peculiarities in the pulse are only sensations in the mind. I think," continues this distinguished physiologist, "I have been certain of the pulse having a disagreeable jar in it when others did not perceive it, when they were only sensible of its frequency and strength: and it is, perhaps, this jar that is the specific distinction between constitutional disease or irritation and health. Frequency of pulsation may often arise from stimulus, but the stroke will then be soft; yet softness is not to be depended on as a mark of health; it is often a sign of dissolution; but then there must be other attending symptoms."—(*On Blood*, part ii., ch. iii., p. 318.)

Dr. Fordyce's table of the pulse is, perhaps, unnecessarily complicated; but the strength or weakness, fulness or smallness, hardness or softness, regularity or irregularity of the pulse, are indications nearly as clear as its frequency or slowness, and, in many cases, quite as diagnostic of the general nature of the disease. Frequency and slowness of the pulse, taken by themselves, indicate little more than the degree of irritability of the heart, or the force of the stimulus that is operating upon it. The strength and regularity, or weakness and irregularity of the pulse, are as palpable to the finger as the preceding sign, and show, in characters nearly as decisive, the degree of vigour or debility of the heart; and, hereby, except where this organ is labouring under some local affection, the vigour or debility of the system, which a mere variation in the state of the frequency of the pulse will not tell us. A full and a small pulse may be distinguished with almost as much ease as any other property it possesses; this Mr. John Hunter ascribes to the state of the arteries: but, if I mistake not, it gives us rather a measure of the quantity of blood circulating through the system, than of the muscular strength of the arteries, or of the heart itself; which is often a very important indication, and especially when combined with the preceding signs; as it will then be our best guide in cases where we have determined upon emptying the vessels as far as we can do it without danger. Hardness and softness of the pulse, together with that vibratory thrill which has been called wiriness, are not quite so easily learned as its fulness and smallness, but a nice finger will readily discriminate them, and practice will point out the difference to every one.* These characters Dr. Fordyce makes dependant, and, I think, with great reason, on the state of the arteries, rather than on that of the heart, or on the quantity of the circulating fluid; and Mr. John Hunter concurs in the same view. They measure the degree of vascular tone, or power of resistance; and when the same effect, whether above or below the natural standard, takes place in the capillary arteries, it produces that change in the pulse which he distinguished by the names of obstruction and freedom, but which it is not always easy to discriminate from several of the preceding qualities; nor is it of great importance, as we have in such cases other symptoms that more strikingly manifest the same fact.†

Thus far, perhaps, the doctrine of pulsation may be studied to advantage: but when, beyond this, we come to a distinction between the free and dilated pulse, as proposed also by Dr. Fordyce; the quick and the frequent, as proposed by Stahl (*De Differentiâ Pulsûs celeris et frequentis*); and the dicrotic, coturnising, and inciduous, proposed by Solano,‡ as mere subvarieties of the rebounding, or redoubling, itself a variety of the irregular pulse, we perplex pathology with a labyrinth in which the student is lost, and the master wanders to no purpose.

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* If a pulse be exceeding *hard*, and at the same time small, then it has been called a *wiry* pulse; if a pulse be both *hard* and *large*, it is a *strong* pulse also; if a pulse be *small* and *soft* together, then it must be considered as *weak*.—See Elliotson's Lectures, delivered at the London University, pub. in Med. Gaz. for 1831–2, p. 141.

† The following useful and practical distinctions of the pulse are from the pen of Dr. Miner. "That pulse is said to be *frequent*, in which there is a great number of attractions and dilatations of the artery in a given time; and *infrequent* when there are but few. The pulse is *quick*, when each contraction and dilatation occupies but a short time, whether there are many or few in a minute; and it is *slow*, when the individual contractions and dilatations occupy a comparatively long time, whether they are numerous or few in a minute. The pulse is *strong*, when every dilatation of the artery gives great resistance to pressure; and *weak*, when it gives but little resistance. The pulse is considered as *full*, when a large quantity of blood passes along at every dilatation of the artery; and it is *small*, when the quantity that passes at each dilatation is considerable. The pulse is *hard*, when the artery may be felt like a wire or tense cord, both in its contraction and dilatation; and it is *soft* when it is felt only in its dilatation, and easily becomes imperceptible on pressure. A *regular* pulse is equal and uniform in frequency, quickness, strength, fulness, and hardness; under the term *irregularity* may be included all those varieties of pulse which do not fall unequivocally under some one of the preceding heads."—See Essays on Fevers and other medical subjects by Miner and Tully, Middletown, 1823. See also The Principles of Medicine, &c., by Samuel Jackson, M. D., Philadelphia, 1832, p. 488.—D.

‡ Novæ Observationes circa Crisium Prædictiones et Pulsûs. Wetsch, Medicinæ ex pulsû Vind., 1770: Vienn., 1773.

"Infida," says Professor Frank, "arbitraria et æquivoca est multorum de pulsibus criticis doctrina."—(*De Curand. Hom. Morbis Epit.*, tom. i., p. 30.)

De Bordeu acquired great reputation in the middle of the last century, for applying the doctrine of pulsation as an index to the diseases of every distinct organ of the body; whence he not only adopted most of the subdivisions of Solano, but added others, and subdivided them still further. He started it as a new hypothesis, which he endeavoured to support by facts and arguments, that every separate organ possesses a principle of life in some measure peculiar to itself, and independent of the rest of the frame; that each is endowed with a proper function, and susceptible of proper sensations and movements; and that, by the agreement and co-operation of all these distinctive powers, the life and health of the entire system are built up and maintained. These principles are developed and defended in his thesis, "De Sensû genericè considerato," published at Montpelier in 1742. Though arrogating the merit of originality, they are, however, little more than a revival of the ancient doctrine of harmony invented by Aristoxenus, and at one time very popular in Greece, as we learn from Lucretius:—

"— Multa quidem sapientum turba putarunt
Sensum animi certâ non esse in parte locatum;
Verùm habitum quemdam vitalem corporis esse,
'ΑΡΜΟΝΙΑΝ' Graiei quam dicunt."*

M. de Bordeu, in adopting this hypothesis, supposed, further, that an affection of any particular organ will occasion a peculiar variation in the pulse from its natural state; and, by a careful attention to these changes, he conceived himself capable of ascertaining the seat of the disease, and the channel through which nature was aiming at a crisis. He describes, in consequence, an overwhelming multiplicity of *organic pulses*: but his general division is into superior and inferior pulses; and this he founds on an observation that the actions of the parts seated above the diaphragm, and of those below, excite very different impressions on the circulatory system. These views are chiefly given in the most famous of all his publications, entitled "Recherches sur le Pouls, par rapport aux Crises."—Paris, 1756, 8vo. This hypothesis became extremely popular in France and Germany, and excited a considerable degree of attention at Edinburgh. It is now, however, little heard of, and is by no means worth reviving.

In effect, a voluminous and complicated clasification of pulses is rather a proof of an active fancy than of a sound judgment: and though Dr. Heberden and Dr. Hunter may have thought too lightly of this branch of pathognomy, it is better to adopt their simplicity than the puerile conceits of many more elaborate pulse-makers. The Chinese have a more operose system of pulsations than any that have appeared in Europe: but nothing can be more whimsical than their divisions, though Floyer fell in love with them, and thought them models of wisdom and accuracy. Avicenna treated of the pulse musically; and Hoffenuffer, pursuing his principles, drew up, in 1641, a musical scale of the pulse, dividing it into musical time, and marking the different beats by semibreves, minums, and crotchets, semiquavers, and demisemiquavers; thus reducing his patient to a harpsichord, and his profession to a chapter on thorough-base.

III. [Blood, when first drawn from the vessels, is an adhesive fluid, of a homogeneous consistence, of the specific gravity of about 1.050, of a red colour in man and the higher animals, and of the temperature of about 98° in the human subject. Soon after its discharge from the vessels, if it be suffered to remain at rest,* it begins to coagulate, and, as the process advances, it separates into two distinct parts, namely, a red mass floating in a yellowish fluid. The red part is called the clot, or crassamentum, and the fluid part the serum. The average time, requisite for the coagulation of venous blood, is said to be seven minutes; and the crassamentum has been estimated to amount to about one third of the weight of the serum.—(*Bostock's Physiology*, vol. i., p. 434.) In the act of coagulation, it is generally believed that an evolution of heat takes place, though the point is yet a contested one; Dr. J. Davy's investigations (*Edin. Med. Journ.*, No. 95) disagreeing with those on which the preceding doctrine is founded, and corroborating the view adopted by Mr. Hunter.

The coagulum, or clot, may be deprived of its red colour by repeated ablution in water; thus showing, as Dr. Bostock observes, that the colouring matter is only mechanically mixed with the substance left behind, called fibrin, and not chymically combined with it.

Many causes of sudden death have the curious effect of impeding the coagulation of the blood. This is exemplified in persons rapidly killed by lightning and electricity; a blow on the stomach, or injury of the brain; by the bite of a rattlesnake, and other venomous animals; by acrid vegetable poisons, like laurel-water; excessive fatigue; and even violent agitation of the mind. In the same cases, Mr. Hunter found a singular coincidence between the want of coagulability in the fibrin of the blood and the loss of contractility in the muscles after death. The body is also disposed to putrefy with unusual quickness. Hence there appears some analogy, if not identity, between muscular contraction, and the coagulation of the fibrin of the blood; an opinion strengthened, as Dr. Bostock has observed, by the fact that the chymical composition of fibrin is similar to that of muscle. From the relation between the coagulation of the blood and the contractility of mus

* De Rer. Nat., lib. iii., 98. See the author's examination of this hypothesis, and its resemblance to others of later date, in the notes to his Translation of Lucretius, book v., 100. and 104.

* Rest, however, is not essentially necessary to the coagulation of the blood; for if this fluid be shaken in a vial it will still coagulate. Prof. Physic has ascertained by experiment that blood will coagulate also without the contact of air.—See Prof. Horner's Anatomy, vol. ii., p. 182.—D

cles, Mr. Hunter appears to have deduced his celebrated hypothesis of the life of the blood; a doctrine which embraces the principle that a fluid is capable of organization, and may be endued with functions either identical with, or very similar to, those which are the most characteristic of the living animal solid.—(*Bostock*, vol. cit., p. 443.)

At the temperature of 160°, the serum itself coagulates, from which a fluid, termed the serosity, may yet be obtained by pressure. The coagulated part is albumen, which principle exists also in the serosity, but is suspended by the presence of an alkali.

The coagulation of the blood is a circumstance, not only interesting to the physiologists, but a source of useful information to the medical practitioner; for certain appearances of the blood, after its coagulation, are a general indication of inflammation, or other disturbance in the system. Thus, when the upper stratum of the coagulum has a yellow buffy look, in consequence of the red globules having subsided from it; when its surface is more or less concave, and the quantity of serum in the basin copious; the blood is said to be sizy, and to exhibit the *buffy coat*, or *inflammatory crust*. As, however, the buffy coat frequently occurs, when no inflammation nor inflammatory fever exists, the state of the pulse and other symptoms should always be duly considered, and the decision for the further use of the lancet never be founded merely on the look of the blood, without reference to other circumstances in the case.]

To speak minutely of the CONSTITUENT PRINCIPLES OF THE BLOOD, would carry us too far into the regions of animal chymistry; and I shall hence limit myself to a very brief analysis of those that are fixed or confinable, having already paid some attention to the gases in the physiological proem to the preceding class.

For the first judicious account of these principles, we are indebted to an elaborate memoir of MM. Parmentier and Deyeux, who arranged them under the following heads:—1. A peculiar aroma, or odour, of which every one must be sensible who has been present at a slaughter-house, on cutting up the fresh bodies of oxen. 2. Fibrin, or fibrous matter, frequently also called coagulable lymph, and gluten. 3. Gelatin. 4. Albumen. 5. Red colouring matter. 6. Iron. 7. Sulphur. 8. Soda. 9. Water.

Still minuter and more exact experiments have since been made upon particular portions of the whole of the blood, especially by Dr. Marcet (*Trans. Medico-Chirurg. Soc.*, vol. ii., p. 370), Dr. Bostock (Id., vol. i.), and Berzelius (Id., vol. iii.), which confirm the greater part of the preceding results, but have detected a few errors, which it is necessary to notice.

Neither the blood of man nor of quadrupeds, so far as it has been examined, contains any gelatin. "The mistake," says M. Berzelius, "arises from the gelatinous appearance of the albumen: I have never been able to detect a particle of gelatin in blood, and, as far as my researches extend, I have found gelatin to be a substance altogether unknown to the economy of the living body, and to be produced by the action of boiling water on cartilage, skin, and cellular membrane; substances which are totally distinct from fibrin and albumen." It follows, therefore, that wherever gelatin is found in the animal frame, it is produced by a decomposition and recombination of the particles of the blood by the action of the secernents. But, instead of the gelatin, Dr. Bostock has since discovered in the serosity, or that part which remains when the lymph or serum has parted with its albumen by heat, a distinct substance, which he has denominated, from its quality, uncoagulable matter (*Elementary System of Physiology*, vol. i., p. 476, 8vo., 1824), and which Dr. Marcet has called muco-extractive matter. Berzelius has affirmed it to be impure lactate of soda.

The sulphur, detected in the blood by Parmentier and Deyeux, does not exist in a free state, but is a component part of its albumen, as are also its carbon and hydrogen, which, in consequence, have as strong a claim to be considered as constituent principles as sulphur. It is by means of its constituent sulphur, that the albumen of blood, or of an egg, becomes capable of blackening a silver instrument employed to stir it.

The iron traced in the blood is, in like manner, a constituent principle of the red colouring matter, and exists in so intimate a union with it, that it cannot be detected by the best reagents we possess, till the composition of the colouring matter is totally destroyed by heat, or some other means.

With these explanations, we are now able to proceed to a clear comprehension of the following brief analysis of the blood, as corrected by the later experiments of Berzelius, supported by those I have just adverted to of Dr. Marcet and Dr. Bostock.

Blood is composed of two parts: one, homogeneous and liquid; and one, only suspended in the liquor, and spontaneously separating from it when at rest.

The homogeneous and liquid part consists of much albumen and a little fibrin, both combined with soda, and all dissolved in water. It also contains a small portion of a few other saline and animal substances.*

* Dr. Stevens has endeavoured to prove, that the fibrin partly owes its fluidity within the body to its being held in solution by the saline substances contained in the serum; but, if this hypothesis were true, the fibrin, one would expect, ought not to be totally insoluble in solutions of neutral salts. It seems to be nearly contradicted, indeed, by one of Dr. Stevens's own experiments. "If, at a certain period after coagulation has commenced, we add muriate of soda, or a saline solution, to the coagulating blood, the moment that the fibrin feels the stimulus of the salt, the whole of it becomes suddenly solid; and," he adds, "I have seen the fibrin of inflammatory blood, which had been drawn during the hot stages of the marsh fever, contract, on the application of salt, with almost as much rapidity as the muscles, when we apply the same stimulus to the fibres in the living body."—Stevens on the Blood, p. 183.

The suspended part consists of the colouring matter. It differs from albumen chiefly in its serum. Iron enters as a constituent ingredient into this material, in the proportion specified in the foot-note. It seems to be the colouring principle; but cannot be separated from it as long as it continues to be colouring matter. This separation can only be effected by combustion, or by the concentrated acids, both of which agents entirely decompose the substance with which the metal is combined. The iron exists in the form of oxyde, with a small proportion of subphosphate of the same. But the colouring matter cannot be artificially produced by uniting albumen with red subphosphate of iron.*

Fibrin, albumen, and colouring matter, have sometimes been considered as modifications of one and the same substance. Each of these three substances *yields*, when decomposed, but does not *contain*, earthy phosphates and carbonate of lime; for the entire blood holds in solution no earthy phosphate, except, perhaps, in too small a quantity to be detected.

From these earths, it is clear, that the bones derive their earthy supply; which, however, it is also clear they can only do, as in the case of the formation of gelatin, in consequence of a decomposition of the blood as it arrives at the secernents of the bones.

Vauquelin endeavoured to separate the colouring matter from the blood by means of sulphuric acid; but this does not very well answer the purpose. A method, proposed by Berzelius, is much simpler, as well as more effective.—(*Ann. de Chim. et de Phys.*, tom. v., p. 42.) It consists in placing the clot or coagulum of blood upon blotting paper, to get rid of the serum as completely as possible. The clot is then to be put into water, in which the colouring matter dissolves, while the fibrin remains unaffected; when, the water being evaporated, the colouring matter is obtained in a separate state. On reducing this matter to ashes, about 1.200 of iron can always be separated.

It is difficult to determine by what means the iron or the sulphur, or the elementary principles of calcareous earth, obtain an existence, or the means of existence, in the blood. If these materials were equally diffused throughout the surface of the earth, we might easily conceive that they are introduced through the medium of food. But as this is not the case, some regions, like New South Wales, at least, on this side the Blue Mountains, containing no limestone whatever, and others no iron or sulphur, while all these are capable of being obtained apparently as freely from the blood of the inhabitants of such regions, as from that of those who live in quarters where such materials enter largely into the natural products of the soil,—it is perhaps most reasonable to conclude, that they are generated in the laboratory of the animal system itself, by the all-controlling influence of the living principle.

What may be the aggregate quantity of any of these minerals in the mass of blood belonging to an adult, has not been determined with accuracy. The amount of the iron has been calculated by Parmentier and Deyeux, upon grounds furnished them by Menghini, at seventy scruples, or very nearly three ounces, estimating the average of blood in the vessels of an adult at twenty-four pounds, which is most probably something short of the mark.

Whether iron exists in any other part of the animal frame than the colouring matter of the blood, is in some degree doubtful. Vauquelin seems to have traced it in egg-shells and oyster-shells; and Mr. Brande thinks he has done the same in the chyle and in the serum, and this as largely as in the colouring matter of the blood, which, after all, he thinks contains only a very minute quantity.* But these experiments are too indefinite, and by no means coincide with those of Berzelius, since confirmed by other chymists. If the experiments of Menghini may be relied upon, human blood contains a larger proportion of iron than that of quadrupeds; quadrupeds have more than fishes; and fishes more than birds.

But, though there can be no longer any question of the existence of iron as a constituent principle in the blood, we are in total ignorance of the part it is intended to perform. It is, perhaps, the colouring material, though, as I have already observed in the physiological proem to the preceding class, even here we are still very much in the dark, and are overwhelmed with contending hypotheses.† It is probable

* According to M. Lecanu, blood contains peroxyde of iron in the proportion of 2.100 in 1000.000. See Ann. de Chim. et de Phys., xlviii., p., 308. The colouring principle is termed *hæmatosine*, 100 parts of which, burnt in the open air, leaves 1.25 of ashes, containing 0.625 of oxyde of iron, and 0.625 of carbonate and phosphate of lime, phosphate of magnesia, and subphosphate of iron, blended together.—Berzelius.

* Phil. Trans., 1812, p. 112. For additional information, see Turner's Elements of Chymistry, and Lecanu's Exp. in Ann. de Chim. et de Phs., vii., 48.

† The theory of Dr. Stevens is, that the colouring matter of the blood is a peculiar animal substance, which has the property of striking a bright red die with salt; and, as salt exists in the serum, that it is the cause of the red colour of arterial blood. The reader will find in the Med. Gazette for 1832-3, p. 881, some valuable observations and experiments on the causes of the colour of arterial and venous blood, by Mr. G. H. Hoffman. If these experiments can be depended upon they prove, 1. That carbonic acid gas will blacken red colouring matter of blood, suspended in the serum. 2. That atmospheric air and oxygen will restore its red colour. 3. That carbonic acid gas does exist in venous blood. 4. That the air-pump is not competent to extract the whole of the gases with which the blood is impregnated. 5. That air or oxygen, without salt, will not redden black blood. 6. That salt, without air, will. 7. That blood, without salt, is black. 8. That blood, with excess of salt, and impregnated with carbonic acid gas, is also black, and that its red colour cannot be restored by air, oxygen, or a further addition of salt. 9. That pure oxygen gas will heighten the red colour of hæmatosine suspended in serum, and impregnated with atmospheric air. 10. That nitrogen gas does not possess a positive power to blacken red blood 11

that the red particles of the blood contribute to the strength of animals to whom they are *natural*, as conjectured by Mr. J. Hunter, and that the strength of such animals is in proportion, or nearly so, to their number. Yet such particles are never found in the blood of several classes of animals, as insects and worms; and in those in which they are found, they have often no existence in the commencement of life; for they are not discoverable in the egg of the chick, when the heart first begins to pulsate; nor are they, in any animals, pushed into the extreme arteries, where we must suppose the serum reaches. And hence, whatever their value, they cannot be regarded as the most important part of the blood, or as chiefly contributing to the growth and repair of the system.—(*On Blood*, pp. 46, 48.)

Various attempts have at different times been made to determine the form and measure the diameter of the corpuscles of the blood; but they do not seem to have been accompanied with very great success. Della Torre, by applying his microscope, detected the red particles, as he thought, to be flat circles or rings, with a perforation in the centre; and Mr. Hewson ascribed to them the same shape, but represented them as hollow or vesicular, with a dot of red colouring matter in the centre instead of a perforation; so that, if his description could have been substantiated, they might literally have been regarded as the wheels of life moving on iron axles. Mr. Hewson's hypothesis, however, extended much farther; for, by a variety of plausible experiments, he persuaded himself, and many others also, that it is the office of the thymus and lymphatic glands to secrete and elaborate these vesicles, which are then carried by the lymphatics and thoracic duct to the arteries, and from the arteries to the spleen, which furnishes them with their coloured axles. Some of these physiological and microscopic *divertissements*, however, have been long overturned; while the general shape of the corpuscles has been gravely shown by other exquisite analyses to be globular: the diameter of which, as measured by the microscopical experiments of M. Bauer, is 1-2000 part of an inch; a dimension, however, which has since been reduced by Captain Kater to 1-5000 part of an inch.* M. Bauer has also ascertained, as he thinks, that it is not the centre of the globule that is dotted, but its outline that is surrounded with colouring matter; so that, instead of being annular wheels with iron axles, they are spherular wheels with iron tires. It is some what singular that, in the revolution of science M. Bauer's views are now sinking below the horizon, while those of Mr. Hewson are again ascending into notice; for the later experiments of M. Prevost have restored to the red corpuscles of the blood their flat circles and points, and divested them of a globular form. MM. Prevost and Dumas believe the colouring matter to be a membrane, by which these corpuscles are surrounded. They pursued a dexterous method of drying the red particles as soon as separated, and found that, when divested of this red matter and rendered colourless, they are of the same size in every animal they examined; being 1-7600 part of an inch,* but that, with the colouring matter, the size differs in different animals; being 1-3100 of an inch in man, the dog, rabbit, pig, guinea-pig, and hedgehog; in the ass, 1-4200; the cat and man, 1-4300; the sheep, horse, mule, and cow, 1-500; and the goat, 1-700. These particles have a peculiar tendency to form themselves into lines, as observed by Sir E. Home; the lines resembling in every respect the muscular fibre. Fibrin they found also to be a collection of colourless corpuscles of the same kind as the above: the same corpuscles may be also traced in the white of the egg. Those of a chick, six days after incubation, they found larger than those of a hen; as also, that those, which in some young animals are circular, afterward become elliptical. Even this last was also observed by Hewson; and the remarks may lead to some facts connected with inflammation, by which they may be influenced; as they may be likewise, by the temperature of hot climates.

According to a later set of experiments by M. Bauer, the fluid of the blood has a tendency to run into globules from the first and simplest stage of its formation; while, as it becomes more elaborated, the globules assume a larger and apparently a firmer form, till they at length become tinged with the red colouring matter. We have hence three distinct orders of globules; the first and minutest of which show themselves in the mesenteric glands, and perhaps in the lacteals, white in colour, and floating in a clear, perfectly colourless fluid. The second and middle orders consist of globules, void of colour, found floating in the serum, and which Sir Everard Home has called lymph-globules, and conceives to be the material chiefly thrown out in the process of inflammation. The third and

That carbonic acid and hydrogen gases do. 12. That on macerating the crassamentum in water for an hour and a half, salt is extracted from a stratum of the coagulum equal in thickness to that which may, while moistened with serum, be reddened for the same length of time by exposure to the air. Mr. Hoffman considers it highly probable, also, from the results of his investigations, that free oxygen gas does exist in arterial blood. These results tend, in the main, to support Dr. Stevens's theory of respiration; although it is admitted, that some links in the chain of evidence, necessary to establish it, are wanting.—Ed.

* Phil. Trans., 1818, pp. 173, 187. Dr. Hodgkin, who has carefully examined the red particles of the blood with a microscope, denies that they are globular; and his description of them is different from that given of them by other experimenters.—See Catalogue of Anatomical Museum of Guy's Hospital, Obs. on sect. xi.—Ed.

* Prof. Wagner, of Erlangen, has repeatedly measured the globules of the blood, and always with the same results. He thinks that they vary in size, being from the three hundredth to the four hundredth of a line in diameter, and that the contradictory estimates of authors depend partly on the imperfection of the micrometers employed, and in the want of accuracy in the observations.—See North American Archives of Med. and Surg. Science, No. 2, p. 153.—D.

largest order is that of the red globules, the colouring matter of which he supposes to be derived from the changes that take place in the act of respiration. But, though the great mass of the globules, found in the lacteal glands, are of the extreme minuteness just described, he observed that many of them were much larger; that about eight tenths varied from the smallest speck to the size of the lymph-globules; that about one tenth were of the size of red globules deprived of the colouring matter; and about one twentieth of the size of the red globules with the colouring matter incasing them. And he is hence inclined to think, that the lacteal glands are the cradle, in which the whole receive their form and structure, however elaborated by other combinations afterward.

The subject, however, even upon these points, calls for much further attention;* and we have also still much to learn, not merely in respect to the real difference between human blood and that of quadrupeds, but the real difference between that of any one species of animal and any other. M. Berzelius observes, that "the great agreement in the composition of human and ox blood is remarkable, and explains to us the possibility of the phenomena observed in the experiments in transfusion." But we have a clear proof, that the blood of one species of animals differs so much from that of another, either in its principles or their modification, that no benefit can result from transfusion, unless from like kinds to like kinds. Thus, according to several interesting experiments of Dr. Blundell, a dog, asphyxiated by hemorrhage, may easily be recovered by a transfusion of blood from another dog, but is little or not at all relieved, if the blood be taken from man (*Transac. Medico-Chir. Soc.*, vol. ix., p. 86); and the experiments of MM. Prevost and Dumas precisely coincide with this doctrine.

[In the operation of transfusion, which seems to have been invented, or, at least, perfected by Lower about 1660, the artery of one animal is connected by a tube with the vein of another animal, under which circumstances the first is gradually deprived of its blood, and the second rendered plethoric. If an opening be made in the veins of the latter, its original blood will escape, and be replaced by that of the other animal. At the time when these experiments were made, diseases were supposed to depend upon morbid qualities in the blood; and as transfusion held out the prospect of changing this fluid at pleasure, it was hailed as a most important means of restoring the health, and some individuals actually submitted to have the blood of lambs or calves transmitted into their vessels, for the purpose of being cured of certain diseases, or of having their vigour renovated.—(*Bostock's Physiology*, vol. i., p. 348.) The first experiments performed on the human subject ended fatally; and in France the continuance of the practice was prohibited by law. Dr. Blundell, however, has established the important fact, that the blood of an animal of the same species may be safely transfused; but, that if the blood of a different kind of animal be employed, great disorder of the functions is occasioned, and death generally ensues. With strict attention to this principle, the experiment has now been tried upon the human subject in several instances, and occasionally with decided success.]*

Upon the whole, we cannot but regard the blood as, in many respects, the most important fluid of the animal machine: from it all the solids are derived and nourished, and all the other fluids are secreted; and it is hence the basis or common pabulum of every part. And, as it is the source of general health, so it is also of general disease. In inflammation, it takes a considerable share, and evinces a peculiar appearance. The miasms of fevers and exanthems are harmless to every other part of the system, and only become mischievous when they reach the blood; and emetic tartar, when introduced into the jugular vein, will vomit in one or two minutes, although it might require, perhaps, half an hour if thrown into the stomach, and, in fact, does not vomit till it has reached the circulation. And the same is true of opium, jalap, and most of the poisons, animal, mineral, and vegetable. If imperfectly elaborated, or with a disproportion of some of its constituent principles to the rest, the whole system partakes of the evil, and a diathesis or morbid habit is the certain consequence; whence tabes, atrophy, scurvy, and various species of gangrene. And if it become once impregnated with a peculiar taint, it is wonderful to remark the tenacity with which it retains it, though often in a state of dormancy or inactivity, for years or even entire generations. For, as every germe and fibre of every other part is formed and regenerated from the blood, there is no other part of the system that we can so well look to as the seat of such taints, or the predisposing cause of the disorders I am now alluding to; often corporeal, as gout, struma, phthisis; sometimes mental, as madness; and occasionally both, as cretinism.

[Whether the blood be primarily affected in certain diseases, or chiefly concerned in the transmission of what have been considered hereditary disorders, as the author has conjectured, are questions very difficult to solve; and the doctrine, if carried too far, would be at variance with some well-established facts, and approved theories, which ascribe the first origin of many complaints rather to an affection of the blood-vessels, absorbents, or nerves, than to a change of the blood itself. It must not be inferred, however, that, in disease, this fluid is not sub-

* These accounts of M. Bauer's investigations were found among Dr. Good's MSS. subsequently to the publication of the third edition of this work, with the place for their intended insertion marked by the author himself.—Ed.

* It is proved, by recent experiments, that foreign substances may sometimes be introduced into the sanguineous system with great benefit. There are several cases recorded in different American journals, where patients, when moribund from cholera, have been immediately benefited, by injecting into the veins a weak solution of the carbonate and muriate of soda.—See note on p. 164.—D.

ject to alteration, a fact, of which the valuable observations of Dr. Armstrong furnish convincing evidence;* nor even that it may not be sometimes the primary vehicle of disease into the constitution. Passing over the variations which occur in its quantity, velocity, and distribution, subjects on which this able physician has offered many judicious and practical reflections, let us attend to what his experience has taught him respecting the altered qualities of the blood in cases of disease. It differs, he says, in different persons, and even in the same person under different circumstances. In general, plethora takes place either in strong individuals of firm fibre, or in plump, lax persons. In both cases, there is a superabundance of the red portion of the blood, but the crassamentum is much firmer in the former subjects than the latter. On the contrary, when local plethora affects the mucous textures of pale, thin men, relaxed by sedentary habits and a spare, slop diet, the red particles are often deficient, and the quantity of fibrin and albumen lessened. A similar effect is well-known to result from copious and repeated blood-letting, the blood becoming thinner and thinner, and the skin paler and more flabby than natural. Indeed, says Dr. Armstrong, the blood is brought into a like condition by protracted disorder, especially where the digestive processes are disturbed, as in cases of chlorosis, in some of which he has known the blood flow from the punctured vein like so much thin claret, or very pale red ink. Nor are the red particles alone affected; for, when rich blood shows the buffy coat on coagulating, it is firm, opaque, and striated generally on the surface; whereas, in poor blood, it is loose and semi-opaque, like so much ill-strained jelly; appearances unequivocally revealing that the fibrin itself is more or less altered. In several cases where the circulation was much increased in force and frequency, Dr. Armstrong has seen the blood gush from an opened vein with the bright vermilion colour of arterial blood; while, on other occasions, where its course had been impeded or retarded in the small arteries, it exhibited a dark venous character. In some examples of fully developed typhus, where the tongue was glazed, dry, and brown, and the lips and cheeks of a dusky or purple hue, he has seen the blood from the temporal artery present a venous colour. The circulation of such blood within the arteries, seems to Dr. Armstrong to be connected with many of the most conspicuous phenomena of the advanced stage of genuine typhus, and dependant upon a specific bronchitis, in which the mucous texture of the bronchial tubes is loaded with dark blood, and smeared with a copious and tenacious secretion. The contagions of smallpox, measles, and scarlatina, he says, first operate on the blood, after which the solids are specifically affected, especially the skin and mucous membrane of the air-passages. In specific fevers, where the venous blood is not duly converted into arterial from the presence of bronchitis, that fluid emits an unpleasant odour, not unlike the smell of bugs. The blood of those who live on animal food has more azote in it than the blood of persons who live on vegetables. A diet of salted meat likewise produces a change in the blood, as illustrated in cases of sea-scurvy. The circulation of extraneous substances in the blood appears to Dr. Armstrong to be a frequent cause of fever, as he has ascertained to be the fact in relation to mercury. Mental derangement he also conceives may sometimes be connected with a morbid state of the same fluid.—(See *Armstrong's Mor. Anat. of Bowels, &c.*, p. 6, 4to., Lond., 1828.) From a case reported in the Lancet, No. ccxxxviii., p. 909, it would appear that, in diseases of the spleen and liver, the blood may even acquire an acid quality.]

As already noticed, the blood has been supposed to be alive; a belief of very high antiquity, and which has been warmly embraced by Dr. Harvey and many others of the first physiologists of modern times.* It was a favourite opinion of Mr. John Hunter, and runs through the whole of his doctrines. "That the blood," says he, "has life, is an opinion I have started above thirty years, and have taught it for near twenty of that time in my lectures. It does not, therefore, come out at present as a new doctrine; but has had time to meet with considerable opposition, and acquire its advocates. To conceive that blood is endowed with life while circulating, is, perhaps, carrying the imagination as far as it well can go; but the difficulty arises merely from its being a fluid, the mind not being accustomed to the idea of a living fluid."—(*On Blood*, p. 77.)

The experiments and train of reasoning he urges in favour of this opinion, are highly ingenious and peculiarly strong. And, though they may not be demonstrative of a vital and energetic essence separate from the blood itself, but inherent in its substance, and controlling its motions, they seem very clearly to show, that the blood is endowed with peculiar powers; and that, as matter at large is subject to the laws of gravitation, so the matter of the blood is subject to the laws of instinct. We may here add, in favour of Mr. Hunter's opinion, the following two corollaries of Dr. Philip, deduced from a large field of experiments. "The power of the bloodvessels, like that of the heart, is independent of the nervous system.—The bloodvessels can support the motion of the blood after the heart is removed."—(*Phil. Trans.*, 1815, p. 445.)

Admitting these deductions to be established, the power here referred to, and capable of influencing the blood or the bloodvessels, separately from that of the heart and of the nervous sys-

* This will doubtless be admitted by those who have examined this fluid, as taken from patients affected with cholera; the analyses of eminent chymists prove, that in this disease the quantity of albumen in the blood is somewhat lessened; the colouring matter is remarkably increased; while the fibrin is excessively diminished.—D.

* The opinion that the blood possesses vital powers is ably sustained by Dr. Caldwell, of Philadelphia, in his *Experimental Inquiry on the Vitality of the Blood*. See also a *Dissertation on the Pathology of the Human Fluids*, by Jacob Dyckman, M. D., New-York, 1814; a work of great merit.—D.

tem, must be the power of symple life, or of instinct, which is simple life operating by the exercise of its own laws.

This view of the subject has of late, however, been carried by Dr. Pring to an extent far beyond what Mr. Hunter at any time contemplated. For Dr. Pring not only supposes the blood to be alive, and to communicate life to the sentient and healthful parts of the system, but to its insentient and diseased elements as well; and that the matter of animal poisons, derived from the blood, are themselves also living bodies, acting specifically by the vital but discrepant properties they are endowed with. And he thinks that hereby "a distinction may be furnished between the contagious and infectious diseases."*

CLASS III.

HÆMATICA.

ORDER I.
PYRECTICA.
FEVERS.

HEAT AND NUMBER OF THE PULSE PRETERNATURALLY AUGMENTED: USUALLY PRECEDED BY RIGOUR, AND FOLLOWED BY PERSPIRATION: DURING THE RIGOUR, PAINS FIXED OR WANDERING: LASSITUDE: DEBILITY OF MIND AND VOLUNTARY MUSCLES.

No complaint is so common as fever; none in which mankind, whether professional or laical, are so little likely to be mistaken, and yet none so difficult to be defined. In reality, no writer seems to have been fully satisfied with his own definition; and it is not extraordinary, therefore, that he should seldom have given satisfaction to others. The difficulty proceeds from the complexity of the symptoms that enter into the character of a fever: the contrariety of many of them to each other in different stages of it; and the occasional absence of some that, in other instances, appear to constitute its leading features. "Febris," says Professor Frank, "certorum potiùs morborum UMBRA, quàm ipse morbus est."†

The nosologist has also two other difficulties of considerable magnitude to contend with in laying down a clear and perspicuous survey of fevers; and that is, their division or collocation, and their generic names. But, as I have already pointed out these difficulties, and the means by which they are attempted to be remedied under the present arrangement and nomenclature, in the running commentary to the Order before us in the volume of Nosology, I shall beg to refer the reader to the observations there laid down, and shall subjoin only one or two additional remarks upon the same subject.

Although the number of the pulse, as well as the heat, is preternaturally augmented in almost every case of fever, an extraordinary instance is sometimes to be met with, that opposes the general law, for the most part dependant, I believe, on a great and sudden oppression of the brain; an explanation which withdraws the anomaly, and accounts for the ordinary increase of pulsation as soon as such oppression is removed. Thus, in the yellow fever of Antigua, in 1816, the pulse, as Dr. Musgrave informs us, was, in one instance, under forty-four. "We almost fancied," says he, "this unusual softness might be constitutional: but, on opening a vein, it greatly increased in frequency; and, after the loss of a considerable quantity of blood, it numbered eighty, with nearly complete relief from every uneasy sensation."—(*Trans. Med. Chir. Soc.*, vol. ix., p. 133.)

In such cases, the heat of the system usually exhibits as little febrile augmentation as the pulse: for, as the former is the result of increased action, till such increased action takes place, the heat, as in the first stage of the paroxysm, may continue even below the natural standard. Ordinarily, however, the heat is considerably heightened, insomuch as in some instances to reach 108° Fahrenheit, which, however, is the utmost point it has ever been known to attain in fever.

There is a still more curious variation from the general law, which is sometimes, though very rarely, found to take place, of which Schenck gives a single example that occurred in his own practice; I mean a reversed order of the symptoms of the febrile paroxysm, and an appearance of the sweating stage before the shivering and hot fit.—(Lib. vi., obs. 34.)

To provide for these extraordinary and anomalous incidents by any definition whatever, is beyond the power of language. They must be left to themselves, and will rather confirm than disturb the definition now offered, agreeably to the maxim of the schools—exceptio probat regulam.

In dividing fevers into distinct genera, I have taken the line of demarcation from the character of their duration, as limited to a single paroxysm; as composed of numerous paroxysms, with intervals of intermission or perfect apyrexy; as composed of numerous exacerbations, with intervals of remission, or imperfect apyrexy; and as composed of a single series of increase and decrease, with a mere tendency to intervals of remission, without perfect apyrexy at any

* Principles of Pathology and Therapeutics, &c. By Daniel Pring, M. D., 8vo., 1823.

† De Curand. Hom. Morb., Epit. i., p. 2, tom. iv., 8vo., Mannh., 1792. "The word *fever*, derived from the Latin term *febris* (a derivative of the verb *ferveo*, signifying, to be hot), is applied to a class of diseases, characterized by *morbid heat of the skin, frequency of pulse*, and *disturbance in the various functions*."—Dr. Tweedie, in Cyclop. of Pract. Med., art. FEVER.

time Other nosologists have drawn their generic distinctions from other circumstances; as their disposition or indisposition to putridity; their inclination to a sporadic or an epidemic character; the vigour and violence, or weakness and debility, of their action; or, in the language of Dr. Darwin, the nature of their influence on the sensitive or irritative fibres of the animal frame. The most obvious mark, however, and that which has been most generally approved, is the character of duration assumed in the arrangement before us. To all the rest, there are greater or less objections, which, as I have already examined them in the comment just referred to, need not be repeated in the present place.

Regulated, therefore, by the principle before us, fever admits of the four following genera:—

I. Ephemera.	Diary Fever.
II. Anetus.	Intermittent Fever.
III. Epanetus.	Remittent Fever.
IV. Enecia.	Continued Fever.

To each of these belong several species, and to most of the species several varieties, as will be noticed in their respective order.

Some slight deviation from the ordinary nomenclature may be observed in the generic names above: but the reader can have no difficulty upon this head, as he will find the changes that have hereby been occasioned are in every instance founded upon a principle of correctness and simplification; and consequently calculated to disentangle rather than to add to his encumbrances, and to facilitate his progress in the labyrinth before him. The term Ephemera, is, indeed, well known to every one. Anetus and Epanetus are Greek terms, importing intermittent and remittent, from *ἀνίημι* and *ἐπανίημι*. Enecia, from the same tongue, denotes continued action, and is a derivation from *ἠνεκής*.

Before, however, we enter upon the practical part of this subject, it appears necessary to make a few remarks upon one or two other questions that have very largely occupied the attention of many pathologists, and especially concerning the proximate and remote causes of fever; and the tendency, which fever has been supposed to evince, of terminating suddenly, either favourably or unfavourably, at fixed periods of its progress.

Proximate and remote causes are rather terms of recent, than of ancient writers. In early times, the causes of diseases chiefly contemplated were PROEGUMENAL, or predisponent, and PROCATARCTIC, or occasional. Thus, an hereditary taint, or habitual indulgence in high living, may be regarded as a proegumenal cause of gout; and catching cold, or an unusual exertion of muscular exercise, may form its procatarctic cause: both of which are absolutely necessary; for, it is clear, that the latter without the former would not produce the malady; and it is just as clear, that the former might remain harmless in the constitution for years, were it not to meet with the co-operation of the latter, which is often, on this account, denominated an exciting cause. Generally speaking, the first was regarded as an internal, and the second as an external cause; and, in the instance selected, they are so; but they are not so always.

To be acquainted with causes of these kinds is always useful; and, in guarding against the approach of diseases, it is often of the utmost importance: but they give us very little information upon the real nature of diseases, and the mode of managing them when present. And hence another set of causes have been adverted to, and have of late been chiefly studied, and particularly in the case of fever. "That only," says Gaubius, "deserves the name of a physical cause, which so constitutes the disease, that, when present, the disease exists; while it continues, the disease continues; when changed or removed, the disease is altered or destroyed." It is this which constitutes the PROXIMATE cause, and is, in fact, the essence of the disease, the actual source of all its effects. The REMOTE cause is that which directly produces the proximate; as a specific virus in syphilis, or a specific miasm in influenza, or epidemic catarrh.

In fever we can often trace the remote causes, though we are still too little acquainted with the nature of several of them to be able to restrict them to a specific mode of action: of the proximate cause, we know but very little at present, and it will probably be long before we shall know much more.

Let us, however, begin with the PROXIMATE CAUSE, as that which has most excited the attention of physicians in all ages. Upon this subject, indeed, a great deal of learned dust has been raised, and a great deal of valuable time consumed. Ancient speculations, for they are not entitled to the name of theories, have been overthrown; and modern speculations, in equal abundance, erected upon their ruins; which in rapid succession, have also had their day and expired. It is an inquiry, therefore, not likely to prove very productive; yet, as forming a part of medical science, of which no student should be altogether ignorant, it seems necessary to take a brief survey of the most popular doctrines which have been advanced upon the subject in different ages.

Fevers, then, in respect to their proximate cause, have been conjectured to originate from a morbid change, either in the composition of the blood, or in the tone or power of the living fibre. The first view has given rise to various hypotheses, that rank under the common division of the HUMORAL PATHOLOGY. The second has given rise to other hypotheses, appertaining to the common division of the FIBROUS or NERVOUS PATHOLOGY.

The hypotheses, derived from the one or the other of these sources, that are chiefly entitled to attention, are the following; of which the first two belong to the former division, and the remainder to the latter.

I. That of the Greek schools, founded on the doctrine of a concoction and critical evacuation of morbific matter.

II. That of Boerhaave, founded on the doc-

trine of a peculiar viscosity, or lentor of the blood.

III. That of Stahl, Hoffmann, and Cullen, founded on the doctrine of a spasm in the extremities of the solidum vivum, or living fibre.

IV. That of Brown and Darwin, founded on the doctrine of accumulated and exhausted excitability, or sensorial power.

V. To which we may add, that fevers have, by some physiologists, as Dr. Clutterbuck, M. Broussais, and Professor Marcus, been identified with inflammation; and their proximate cause been ascribed to increased action in some particular organ.

I. It was the opinion of Hippocrates, that fever is an effort of nature to expel something hurtful from the body, either ingenerated, or introduced from without. Beholding a violent commotion in the system, followed by an evacuation from the skin and kidneys, with which the paroxysm terminated, he ascribed the commotion to a fermentation, concoction, or ebullition, by which the noxious matter was separated from the sound humours; and the evacuation to a despumation or scum which such separation produces, or rather to the discharge of this morbid scum from the emunctories that open externally. Galen supported this view with all the medical learning of his day; and it is the only explanation of fever to be met with in medical writings, through the long course of three thousand years; in fact, till the time of Sydenham, who still adhered to it, and whose pages are full of the language to which it naturally gave birth.

It blended itself almost immediately with the dialect of the chymists of the day, notwithstanding the professed hatred of Paracelsus and Van Helmont towards the whole range of Galenic doctrines, and the solemn pomp with which the former had condemned and burnt the entire works of Hippocrates and Galen. And hence, under the influence of chymistry, at this time assuming a soberer aspect, the supposed animal despumation was contemplated as possessed, according to different circumstances, of different chymical qualities and characters; and particularly as being acid, alkaline, effervescent, or charged with some other acrimonious principle, too highly exalted, or in too great a proportion.

This doctrine, considered merely hypothetically, is not only innocent, but highly ingenious and plausible. It is in unison with several of the phenomena of pyrectic diseases, and derives a strong collateral support from the general history of exanthems, or eruptive fevers, in which we actually see a peccant matter, producing general commotion, multiplying itself as a ferment, and, at length, separated and thrown off at the surface by a direct depuration of the system.

There is no writer, perhaps, in our own day, who has carried this view of the subject farther, or even so far, as Professor Frank, who regards typhus, plague, petechial, and all pestilential fevers, and, indeed, nervous fevers of every kind, whether continued or remittent, not only as proceeding from specific contagions in the same manner as exanthems, but from contagions producing a like leaven in the system, and matured and thrown off through the various outlets of the body, by the same process of depuration; and hence, after describing all the varieties of malignant nervous fevers under the character of pestilential, he tells us "non aliter hæc methodus in ipsâ PESTE tum in PESTILENTIALI, sic vocatâ, febre, profuisse visa est: ubi, *maturo satis tempore*, CONTAGII PER CUTEM EXPULSIO solicitè à medentibus absolvebatur."—(*De Cur. Hom. Morb. Epit.*, tom. i., p. 130, compare with the ◊ p. 127.)

So far, however, as relates to exanthems, the opinion is sufficiently correct. But the moment it is brought forward as the proximate cause of fever, properly so called, in which there is no specific eruption, it completely fails.

For, first, no explanation is here given as to the means by which any such concoction or fermentation, or multiplication of morbific matter in any way, takes place. Next, there are many fevers produced evidently by cold, fear, and other excitements, as well mental as corporeal, in which most certainly there is no morbific matter introduced, and wherein we have no reason to conceive there is any generated internally; while the disease, limited, perhaps, to a single paroxysm, closes, nevertheless, with an evacuation from the skin or the kidneys. And, thirdly, we sometimes behold fevers suddenly cured, as Dr. Cullen has observed, by a hemorrhage so moderate, as, for example, a few drops of blood from the nose, as to be incapable of carrying out any considerable portion of a matter diffused over the whole mass of the blood; while we are equally incapable of conceiving how such diffused morbific matter could collect itself at a focal point, or pass off at a single outlet, or of tracing in the discharge, after the minutest examination, any properties different from those of blood in a state of full health.

I have observed that this hypothesis is, however, harmless enough when merely brought forward as a speculation. But it has not always been limited to this point; for it has occasionally been advanced as a practical and efficient principle; and the febrile commotion, and particularly the hot fit, has, in treating the disease, been purposely increased, with a view of assisting nature in her curious but unknown process of expelling the peccant material, and the most dangerous consequences have followed.

II. The acute and penetrating mind of Boerhaave, who was born in 1668, was sufficiently sensible of this danger; and the discoveries which were now taking place in chymistry and physiology, led him progressively to the construction of a new theory, which in a few years became so popular as to obtain a complete triumph over that of the Greek schools.

Leeuwenhoeck, by a delicate and indefatigable application of the microscope to animals of a transparent skin, had endeavoured to establish it as a fact that the constituent principles of the

blood consist of globular corpuscles; but, that these corpuscles differ in size in a regular descending series, according to the constituent principles themselves; and that each set of principles has its peculiar bloodvessels, possessing a diameter just large enough to admit the globules that belong to it, and consequently incapable, without force, of allowing an entrance to those of a larger magnitude; and hence, that the bloodvessels possess a descending series as well as the particles of the blood.

It was upon this supposed fact that Boerhaave built his hypothesis. He conceived that almost all diseases may be resolved into an introduction of any given series of particles of blood into a series of vessels to which they do not properly belong, and he distinguished such introduction by the name of *error loci*. He conceived, still further, that this heterogeneous admixture is very frequently taking place; and that its chief cause consists in a disproportion of one or more sets of the sanguineous principles to the rest, by which their globular form is occasionally broken down or agglutinated; and hence rendered too thin and serous, or too gross and viscid. The viscidity of the blood he distinguished by the name of LENTOR; and to a prevalence of this lentor, or viscidity, he ascribed the existence of fever; maintaining, that the general disturbance which constitutes fever proceeds from an ERROR LOCI of the viscid blood, whose grosser corpuscles, from their undue momentum as well as superabundance, press forcibly into improper series of vessels, and stagnate in the extremities of the capillaries, whence the origin of the cold stage, and consequently of the stages that succeed it, to which the cold stage gives rise (Aph. 756, *Comment. Van Swiet.*, tom ii., p. 528, edit. Lugd. Bat., 4to., 1745); and hence those medicines which were supposed capable of dissolving that tenacity, or breaking down the coalescence of such a state of the blood, were denominated DILUENTS, HUMECTANTS, and ATTENUANTS, while those of an opposite character were called INSPISSANTS: terms which have descended to our own day, and are still retained, even by those who pay little attention to the hypothesis that gave them birth.

The system of Boerhaave, therefore, consisted of an elegant and artful combination of both the earlier and later doctrines of corpuscular physiology. Without deserting the humoral temperaments of Galen, or the constituent elements and elective attractions of the alchymists, he availed himself of the favourite notions of the corpuscular pathologists, their points or stimuli, their frictions, angles, and spherules, derived from the Cartesian philosophy, which was now exercising as triumphant a sway over the animal as over the material system, and interwove the whole into an eclectic scheme, so plausible and conciliatory, that all parties insensibly felt themselves at home upon it, and adopted it with ready assent. In the emphatic language of M. Quesnay, it was "LA MEDECINE COLLECTIVE."

The most triumphant fact in favour of the Boerhaavian hypothesis is, that the crust in the blood in inflammations, and cauma or inflammatory fever, is often found peculiarly dense. But, as fevers (and certainly the greater number) are found without any crust; and, as a similar crust, though, perhaps, not quite so dense, exists under other and very different states of body, as in pregnancy and scurvy (porphyra), even this leading appeal has long lost its power of conviction: while the abruptness with which fevers make their assault, from sudden occasional causes, and in constitutions of every diversity, forbid the supposition that, in such cases, a lentor or sizy crasis of the blood, and especially a *glutinosum spontaneum*, can have time to be produced, however it may exist occasionally, and be, perhaps, the source of other disorders. The subject, however, has of late been again taken up by Dr. Storker of Dublin, with a view of reviving the humoral pathology in its more important doctrines, and of extending the arguments which have hitherto been urged in its favour.*

III. To the period of Boerhaave, in the production of fever, and, indeed, of all other diseases, the human body was regarded as almost entirely passive, a mere organic machine, operated, indeed, upon by some AUTOCRATEIA, as NATURE, or a VIS MEDICATRIX, but in the same manner as other machines, and mostly by similar laws. Its muscles were contemplated as mechanical levers, and its vessels as hydraulic tubes, whose powers were calculated upon the common principles of mechanics and hydrodynamics, and were only supposed to be interfered with by the internal changes perpetually taking place in the fluids they had to convey. A new era, however, at length began to dawn upon the world; a more comprehensive spirit to pervade medical study: the animal frame was allowed to exhibit pretensions superior to the inanimate, and not only to be governed by powers of its own, but by powers which are continually and systematically, from a given point,

* Pathological Obs., &c., Dublin, 8vo., 1823. See also Armstrong's Morbid Anatomy of the Bowels, &c., p. 6, et seq., 4to., Lond., 1828; and Dr. Clanny's Lect. on Typhus Fever. According to Dr. Stevens's investigations, when the bodies of persons who died of yellow fever were opened, the heart was found to contain, instead of blood, a dissolved fluid nearly as thin as water, and as black as ink. In both sides of the heart the fluid was equally black, and throughout the vascular system all distinction between venous and arterial blood was completely lost. Dr. Stevens thinks that the blood first loses its solid parts, and becomes thin; that it then becomes deprived of its saline principles, and turns black and vapid; and lastly, that it loses its vitality, so as to become incapable of supporting life. He regards this diseased state of the blood as the first link in the chain of morbid phenomena which constitute fever, and believes that the aerial poisons, from which all pestilential diseases arise, are attracted with the atmospheric air into the circulation, mix directly with the blood in the pulmonary system, and this poisoned or diseased state of the circulating blood is the cause of the subsequent morbid action in the solids.—ED.

operating to a preservation of health where it exists, and to a restoration of health where it has been lost or injured. Stahl, who was contemporary with Boerhaave, and in the university of Halle, in 1694, first started this loftier and more luminous idea—more luminous, though the light was still struggling with darkness—made the mind the controlling principle, and the solidum vivum, or nervous system, the means by which it acted. Fever, on his hypothesis, consisted in a constrictive or *tonic spasm*; in his own language, *spasmus tonicus*, produced by a torpor or inertness of the brain, at the extremity of the nerves, and counteracted by the remedial exertions of the mind, the *vires medicatrices* of his hypothesis, labouring to throw off the assailing power; whence the general struggle and commotion by which the febrile paroxysm is characterized. Hoffmann, who was a colleague of Stahl, took advantage of this new view, followed up the crude and primary ideas of Stahl with much patient and laborious investigation, and soon presented to the world a more correct system, in a more attractive style; but, apparently, with a disingenuous concealment of the source from which he had borrowed his first hints. He omitted the metaphysical part of the Stahlian hypothesis, took from the mind the conservative and remedial power over the different organs, with which Stahl had so absurdly endowed it; seated this power as a law of life in the general organization; separated the nervous from the muscular fibres, the latter of which were regarded as only the extremities of the former by Stahl; allowed a wider range and longer term to the constrictive spasm of fever, and changed its name from *spasmus tonicus* to *spasmus pepherícus*;* giving also to the moving power of the muscular or irritable fibres the name of *vis insita*, as that of the nervous fibre was called *vis nervea*.

It is highly to the credit of Boerhaave that his mind, in the latter part of his life, was so fully open to the merits of this hypothesis that he admitted the agency of the nervous power, though a doctrine that struck at the root of his own system, of which we have a clear proof in the change which occurs in the fourth edition of his Aphorisms, and particularly aphorism 755, where he lays down the proximate cause of intermitting fevers. Hitherto it had run thus: "Unde post accuratum examen totius historiæ intermittentium causa proxima constituitur viscositas liquidi arteriosi." But to this, in the edition before us, is added the following: "forte et nervosi (liquidi) tam cerebri, quam cerebelli cordi, destinati, inertia."—(*De Motû Tonico. Theoria Medica vera*, Halle, 1734.)

It is also equally creditable to the learned Gaubius, that, though strongly attached to the Boerhaavian school, in which he was educated, and a zealous contender for many of its doctrines, his understanding was alike open to the clearer and simpler views of the chymists of the day, upon various points not yet generally adopted, and allowed him to become a more thorough convert to their philosophy. The reader may judge of this change in his mind by the following passage: "An et naturæ humanæ facultas inest, moleculas, acris detritas aut intropressas angulis, in sphærulas tornando, blanditium creandi? Non satis constat speciosam ideam æqualiter in fluidam solidamque acrimoniam quadrare.—Credibilius profectò mixtione chemica magis quam mechanica rotundatione, id opus perfici."—(*Pathol.*, § 298–300.) In effect, there not only was at this time, but had been for many years antecedently, a general feeling among the cultivators of medicine, that neither the laws of animal chymistry, nor of the living fibre, had been sufficiently studied for the purposes of a correct pathology: in proof of which it may be sufficient to refer to various articles on both subjects, inserted in the Ephemerides Naturæ Curiosorum, published at Frankfort, in 1684; and the writings of Baglivi (*Specimen de Fibrâ Motrici et Morboso*) and Dr. Willis (*Pathologia Cerebri et Nervorum*), and still more particularly to Dr. Gilchrist's elaborate treatise on nervous fevers (*Edin. Med. Trans.*, vol. iv., art. xxiii.; and vol. v., part ii., art. xlviii.); who, following up the hint thrown out by Boerhaave in the aphorism just quoted, endeavours to show how well the two ideas of lentor and spasm are disposed to amalgamate in forming the proximate cause of fever; the spasm consisting of a universal muscular tension, and the lentor being united, according to the nature of the case, with inflammation, acrimony, or both; and hence often producing what he denominates an alternate NISUS and RENISUS.

The materials, however, were now becoming too unwieldy; and the wheels of the machine were clogged by the very forces that were designed to increase its motion. Dr. Cullen was well aware of this, and boldly ventured upon a new attempt for the purpose of simplifying and facilitating its progress. For his basis he took the hypothesis of Stahl, as modified and improved by Hoffmann: and on this basis erected his stately and elaborate structure, so well known to the medical world, full of ingenuity and daring genius, and which, if it be at this moment crumbling into decay, certainly is not falling prostrate before any fabric of more substantial materials, or more elegant architecture. Dr. Cullen has been accused of the same want of ingenuousness towards Hoffmann, as Hoffmann is chargeable with towards Stahl; and of having introduced his system to the public with little or no acknowledgment of the sources from which he has drawn. But, surely, no one can bring forward such an accusation, who has read with any degree of attention the preface to his Practice of Physic, in which he gives a full account of Dr. Hoffmann's system in his own words, and pays complete homage to his merit.

According to the more elaborated principles of the Cullenian system, the human body is a congeries of organs, regulated by the laws not of inanimate matter, but of life, and superintended by a mobile and conservative power or energy,

* Med. Nat. Systemat., tom. iii. § 1, cap. 4. Bochmer, Diss. de Spasmi Peripherici signo in Febribus continentibus, Hal., 1765.

seated in the brain, ut distinct from the mind or soul; acting *wisely* but *necessarily*, for the general health; correcting deviations and supplying defects, not from a knowledge and choice of the means, but by a pre-established relation between the changes produced and the motions required for the restoration of health; and operating, therefore, through the medium of the moving fibres, upon whose healthy or unhealthy state depends the health or unhealthiness of the general frame: which fibres he regarded, with Stahl, as simple nerves, the muscular filaments being nothing more than their extremities, and by no means possessed of an independent vis insita.

The brain, therefore, upon this hypothesis, is the primum mobile, but it closely associates in its action with the heart, the stomach, and the extreme vessels. The force of the heart gives extension to the arteries, and the growth of the body depends upon such extension, in conjunction with the nutritious fluid furnished by the brain, and deposited by the nerves in the interstices of their own fibres; the matter of which fibres is a solid of a peculiar kind, whose parts are united by chymical attraction. All nervous power commences in the encephalon; it "consists in a motion beginning in the brain and propagated from thence into the moving fibres, in which a contraction is to be produced. The power by which this motion is propagated we name," says Dr. Cullen, "the ENERGY of the brain; and we therefore consider every modification of the motions produced, as modifications of that energy."—(*Mat. Med.*, part ii., chap. viii., p. 349.) He further lays it down as a law of the economy, that the energy of the brain is alternately excited and collapsed, since the very fibrous contraction is succeeded by a relaxation: whence spasms and convulsions are *motus abnormes*, and consist in an irregularity of such alternation. But we must distinguish in this system between the energy of the brain and the vital fluid it sends forth by the nerves: for, while the former rises and sinks alternately, the latter remains permanently the same. It is not a secretion, but an inherent principle, never exhausted, and that never needs renewal.—(*Mat. Med.*, part ii., chap. vi., p. 223.)

This hypothesis, in its various ramifications, influenced every part of his theory of medicine, and consequently laid a foundation for his doctrine of fever. The proximate cause of fever was, in his opinion, a collapse or declination of the energy of the brain, produced by the application of certain sedative powers, as contagion, miasm, cold, and fear, which constitute the remote causes. This diminished energy extends its influence over the whole system, and occasions a universal debility; but chiefly over the extreme vessels, on which it induces a spasm; and in this spasm the cold fit is supposed to consist.

"Such, however," to adopt the words of Dr. Cullen himself (*Prac. of Phys.*, § xlvi.), "is the nature of the animal economy, that this debility proves an indirect stimulus to the sanguiferous system; whence, by the intervention of the cold stage, and spasms connected with it, the action of the heart and larger arteries is increased, and continues so till it has had the effect of restoring the energy of the brain, of extending this energy to the extreme vessels, of restoring therefore their action, and thereby especially overcoming the spasm affecting them; upon the removing of which, the excretion of sweat, and other marks of the relaxation of the excretories take place."

This relaxed or perspiratory section of the paroxysm, however, is not regarded by Dr. Cullen as a part of the disease, but as the prelude to returning health. Yet the fit still consists of three stages: the first, of debility or diminished energy; the second, of spasm, and the third, of heat. And though Dr. Cullen had some doubts whether the remote cause of fever might not produce the spasm, as well as the atony of the nervous system, yet he inclined to ascribe the second stage to the operation of the first, as he did most decidedly the third to that of the second: and thus to regard the whole as a regular series of actions, employed by the vis medicatrix naturæ for the recovery of health.

That fever, in its commencement, or earliest stage, is characterized by debility of the living fibre, or, more closely in the words of Dr. Cullen, by diminished energy of the brain, extending directly or indirectly to the voluntary muscles and capillaries, and producing the *signa prodroma* of Professor Frank (*De Curand. Hom. Morb.*, tom. i., page 3, 8vo., Mannh., 1792), cannot for a moment be doubted by any one who accurately watches its phenomena. And thus far the Cullenian hypothesis is unquestionably correct; as it appears to be also in supposing the cold stage to be the foundation of the hot, and of the excretion of sweat, by which the hot stage is succeeded; the entire series forming Frank's *signa constitutiva*. But it fails in the two following important points, without noticing a few others of smaller consequence. The spasm on the minute vessels, produced by debility, takes the lead in the general assault; and, though it forms only a link in the remedial process, is the most formidable enemy to be subdued; and hence, all that follows in the paroxysm is an effort in the system to overcome this spasm. The effort at length proves successful, the debility yields to returning strength, the spasm is conquered, and the war should seem to be over. But this is not the fact: the war continues notwithstanding; there is nothing more than a hollow truce; debility and spasm take the field again, and other battles remain to be fought. There is nothing in this hypothesis to account for a return of debility and spasm after they have been subdued; nor to show why spasm should ever in the first instance be a result of debility. "In this system," says Dr. Parr, "the production of spasm by debility is an isolated fact without a support; and the introduction of the vires medicatrices naturæ is the interposition of a divinity in an epic, when no probable resource is at hand."

The next striking defect is, that debility is here made a cause of strength; the weakened action of the first stage giving rise to the increased action and re-excited energy that restore the

system to a balance of health: and here again we stand in need of the interposition of some present divinity, to accomplish such an effort by such means.

IV. It is not, therefore, to be wondered at, that this system, with all its ingenuity and masterly combination, should not have proved satisfactory to every one. In reality, it did not for many years prove satisfactory to every one in the celebrated school in which it was first propounded. And hence, under the plastic hands of Dr. Brown, arose another hypothesis, of which I shall proceed to give a very brief outline, together with the modification it received under the finishing strokes of Dr. Darwin.

Dr. Brown, who was at first a teacher of the classics at Edinburgh, and a translator of inaugural theses into Latin, commenced the study of medicine about the middle of life, by a permission to attend the medical schools gratuitously. He was at first strongly attached to Dr. Cullen and Dr. Cullen's system; but an altercation ensued, and he felt an equal animosity towards both. A new and opposite system, if so it may be called, was in consequence manufactured and publicly propounded in a variety of ways. It had great simplicity of principle, and some plausibility of feature; it attracted the curious by its novelty, the indolent by its facility, and every one by the boldness of its speculations. It circulated widely, and soon acquired popularity abroad as well as at home.

Man, according to Dr. Brown, is an organized machine, endowed with a principle of excitability, or predisposition to excitement, by means of a great variety of stimuli, both external and internal, some of which are perpetually acting upon the machine; and hence the excitement, which constitutes the life of the machine, is maintained. Excitability, therefore, is the nervous energy of Dr. Cullen; and, like that, is constantly varying in its accumulation and exhaustion: yet not, like the nervous energy of Dr. Cullen, under the direction and guidance of a vis conservatrix et medicatrix naturæ, distinct from the matter of the organization itself, but passively exposed to the effect of such stimuli as it may chance to meet with, and necessarily yielding to their influence.

Upon this hypothesis excitement is the vital flame, excitability the portion of fuel allotted to every man at his birth, and which, varying in every individual, is to serve him without any addition for the whole of his existence; while the stimuli, by which we are surrounded, are the different kinds of blasts by which the flame is kept up. If the fuel, or excitability, be made the most of, by a due temperature or mean rate of blasts or stimuli, the flame or excitement may be maintained for sixty or seventy years. But its power of supporting a protracted flame may be weakened by having the blast either too high or too low. If too high, the fuel or excitability will, from the violence of the flame, be destroyed rapidly, and its power of prolonging the flame be weakened directly; and, to this state of the machine Dr. Brown gave the name of indirect debility, or exhausted excitability. If the blasts or stimuli be below the mean rate, the fuel, indeed, will be but little expended, but it will become drier and more inflammable; and its power of prolonging the flame will be still more curtailed than in the former case; for half the blast that would be required to excite rapid destruction antecedently, will be sufficient to excite the same effect now. This state of the machine, therefore, the author of the hypothesis contra-distinguished by the name of direct debility, or accumulated excitability.

Upon these principles he founded the character and mode of treatment of all diseases. They consist but of two families, to which he gave the name of sthenic and asthenic; the forms produced by accumulated excitability, and marked by direct debility; the latter occasioned by exhausted excitability, and marked by indirect debility. The remedial plan is as simple as the arrangement. Bleeding, low diet, and purging, cure the sthenic diseases; and stimulants of various kinds and degrees, the asthenic.

Fevers, therefore, under this hypothesis, like other diseases, are either sthenic or asthenic; they result from accumulated or exhausted excitability. Synocha, or inflammatory fever (cauma under the present arrangement), belongs to the first division, and typhus to the second. Let us try the system by these examples.

The first symptoms of inflammatory fever, like those of all others, evince, as I have already observed, debility or languid action in every organ, let the debility be distinguished by whatever epithet it may. The vital flame is weak, and scarcely capable of being supported; and yet the fuel is more inflammable than in a state of health; the excitability is accumulated. This scheme, therefore, completely fails in accounting for the origin or first stage of inflammatory, or, in Dr. Brown's own language, sthenic fever.

Typhus pestilens, or jail-fever, is arranged by Dr. Brown as an asthenic disease; and, as such, we have reason to expect debility, as characteristic of its entire progress. Yet, what is it that produces this debility? The blast or stimulus is here contagion; and the excitability is exhausted by the violence of this blast or stimulus; but there is no means of its becoming exhausted without increasing the excitement: the fuel can only be lessened by augmenting the flame that consumes it. Yet in typhus, according to this hypothesis, the fuel is expended, not in proportion as the flame is active and violent, but in proportion as it is weak and inefficient. The excitability is exhausted, and the debility increases in proportion as the excitement forbears to draw upon it for a supply. The blast blows hard, but without raising the fire, and yet the fuel consumes rapidly. This scheme, therefore, completely fails in accounting for any stage of low or asthenic fevers of every description.

Dr. Brown, however, was not a man of much practice; his writings show that he was but little versed in the symptoms of diseases, his

descriptions are meager and confused: and hence, when he comes to assort diseases into the only two niches he allots for their reception, he makes sad work; and maladies of the most opposite characters, and demanding the most opposite mode of treatment, are huddled together to be treated in the same manner, in many cases with no small risk of the patient. Thus, among the sthenic diseases are associated rheumatism, erysipelas, scarlet and inflammatory fever; and, among the asthenic, gout, typhus, apoplexy, and dropsy.

The Brunonian hypothesis, nevertheless, offers one principle that is unquestionably founded on fact, and is peculiarly worthy of attention; I mean, that of accumulated excitability from an absence or defect of stimuli; in colloquial language, an increase of energy by rest. And it is this principle which forms the hinge on which turns the more finished system of Dr. Darwin.

Sensible of the objection that weighs equally against that part of the system of Dr. Cullen and Dr. Brown, which represents the energy or excitability of the living frame as capable of recruiting itself after collapse or exhaustion, without a recruiting material to feed on, he directly allows the existence of such a material; regards it as a peculiar secretion, and the brain as the organ that elaborates and pours it forth. The brain, therefore, in the system of Dr. Darwin, is the common fountain from which every other organ is supplied with sensorial fluid, and is itself supplied from the blood, as the blood is from the food of the stomach.

All this is intelligible; but when, beyond this, he endows his sensorial fluid with a mental as well as a corporeal faculty, makes it the vehicle of ideas as well as of sensation, and tells us, that ideas are the actual "contractions, or motions, or configurations, of the fibres which constitute the immediate organ of sense" (*Zoonom.*, vol. i., sect. ii., ii., 7), he wanders very unnecessarily from his subject, and clogs it with all the errors of materialism.

He supposes the sensorial power, thus secreted, to be capable of exhaustion in four different ways, or through four different faculties of which it is possessed: the faculty of IRRITABILITY, exhausted by external stimuli affecting simple irritable fibres: that of SENSIBILITY, exhausted by stimuli affecting the fibres of the organs of sense: that of VOLUNTARITY, exhausted by stimuli affecting the fibres of the voluntary organs, acting in obedience to the command of the will; and that of ASSOCIABILITY, exhausted by stimuli affecting organs associated in their actions by sympathy or long habit. By all, or any of these means, the sensorial power becomes evacuated, as by food and rest it becomes replenished, often, indeed, with an accumulation or surplus stock of power.

In applying this doctrine to fever, he considers its occasional causes, whatever they may be, as inducing a quiescence or torpor of the extreme arteries, and the subsequent heat as an inordinate exertion of the sensorial power hereby accumulated to excess; and, consequently, the fever of Dr. Darwin commences a stage lower than that of Dr. Cullen, or in the cold fit, instead of in a collapse of the nervous energy lodged in the brain.

Now, allowing this explanation to account for the cold and hot stages of a single paroxysm of fever, like the spasm of Dr. Cullen, it will apply no farther. For when the sensorium has exhausted itself of its accumulated irritability, the disease should cease. It may, perhaps, be said, that a second torpor will be produced by this very exhaustion, and a second paroxysm must necessarily ensue. Admitting this, however, for a moment, it must be obvious that the first or torpid stage only can ensue; for the system being now quite exhausted, the quiescence that takes place during the torpor can only be supposed to recruit the common supply necessary for health; we have no reason to conceive, nor is any held out to us, that this quantity can again rise to a surplus. Yet it must be farther remarked, that, in continued fevers, we have often no return of torpor or quietude whatever, and, consequently, no means of re-accumulating irritability; but one continued train of preternatural action and exhaustion, till the system is completely worn out. And to this objection, the Darwinian hypothesis seems to be altogether without a reply.

A still later modification of the Brunonian system (for after all it is such, though the name of Brown is hereby openly despised), has been attempted in France by M. Broussais, and has acquired a very considerable degree of popularity, though a popularity that seems to have little chance of a longer duration than the two forms by which it has been preceded. Throwing out of the catalogue of vital properties the sensibility of Bichat, and indeed all other vital properties whatever but organic contractility, he maintains that this alone is the real source of all diseases whatever, and that no other exists or is wanted. This contractility is the excitability of Brown, and to the excitement that flows from it M. Broussais has given the name of irritation or excitation, upon a plus or minus degree of which all diseases, as in the hypothesis of Brown, are dependant. But he has this great advantage over Brown, that, instead of making the state of excitement or depression common to the entire system, M. Broussais limits both to particular organs, and contends, that when an organ is in a state of irritation, or *vital erection*, to adopt another quaint term from the technology he employs, such effect can only take place at the expense of some other part of the system, the contractility of which is proportionably diminished.—(*Exposition de la Nouvelle Doctrine Médicale, &c., Par J. R. A. Goupel, Paris*, 1824.) Diseases with him, therefore, proceed, for the most part, from an unequal distribution of excitation or irritation; and as the doctrine of sympathy is carried to a considerable extent, and plays a very important part in the pathological drama, often, indeed, a very ingenious part, the author of the hypothesis obtains an easy and occasionally a correct mode of accounting for local diseases that originate in re-

mote quarters; as, for example, when his favourite gastro-enteritis is the result of a cold, damp atmosphere applied to the skin, or a morbid condition of the lungs or of the head. So that gastritis or gastro-enteritis, primary or induced, is almost every thing with him: all fevers are local affections, and, under whatever shape they may appear, their real seat is the stomach, or alvine canal. Among many weak parts of the hypothesis, one of the weakest is its inability of accounting for the chymical changes that are so perpetually taking place in the system during the influence of disease. For as the only source of disease is in the *quantity* of the efflux of the vital fluids, without any change whatever in their *quality*, it leaves us entirely in the dark as to the origin of scrofula, cancer, all the exanthems, and, in few words, every other specific poison or morbid secretion whatever; the greater part of which, if not the whole, are still referred to a gastric origin, where we are expressly commanded to look as definitely for the real seat of plague, as for bilious fever, yellow fever, Indian cholera, or dysentery.*

It is not necessary to pursue this subject farther. Other conjectures, more or less discrepant from those now examined, have been offered: but they have not acquired sufficient notice, nor evinced sufficient ingenuity, to be worthy of examination.

V. Other pathologists have referred the proximate cause of fever to a morbid affection of some particular organ, or set of organs, associated in a common function. Thus, Baron Haller alludes to several in his day, who ascribed it to a diseased state of the vena cava (*Bibl. Med.*, Pr. i., p. 112); Bianchi pitched upon the liver (*Hist. Hepat.*, p. 112); Swalve on the pancreas (*Pancreas*, &c., p. 141), Rahn on the digestive organization generally.—(*Briefwechsel*, band. i., p. 150.) Professor Frank has divided the different kinds of fever between the digestive organs, the arteries, and the nerves, each in a particular state of diseased action; so that with him all fevers are nervous, inflammatory, or gastric.—(*De Cur. Morb. Hom. Epitome*, tom. v., 8vo., Mannh., 1792–4.) The Italian pathologists eagerly caught up this view, and modified it in various ways; and Broussais has of late given it another modification, by placing fever in the mucous membrane of any of the viscera, but chiefly in the mucous membrane of the digestive canal; and consequently gastric fever, with Broussais, takes the lead of all the rest, both in variety and vehemence of action: the particular character or intensity of the fever being resolvable into the temperament, idiosyncrasy, or other circumstances of the individual.—(*Examen*, &c., *par F. J. V. Broussais*, D. M., 8vo., 1821.) Dr. Clutterbuck has still more lately, in our own country, and with far more reason and learning, brought forward the brain instead of the stomach; to an inflammation of which organ he ascribes fevers of every kind, regarding them merely as so many varieties of one specific disease, originating from this one common cause.—(*Treatise on Fever*, 8vo.) But this is to confound fever with local inflammation, the idiopathic with the symptomatic affection. In treating of inflammation under the ensuing Order, we shall have sufficient opportunities of seeing, that an inflamed state of almost any organ, and especially of membranous organs, or the membranous parts of organs, is sufficient to excite some degree of fever or other, and not unfrequently fever of the highest degree of danger from its duration or violence. And hence, the liver, the lungs, the stomach, the intestines, the peritonæum, and the brain, have an equal claim to be regarded as furnishing a proximate cause of fever when in a state of inflammation.

A very striking objection to Dr. Clutterbuck's hypothesis is, his limiting himself to a single organ as the cause of an effect, which is equally common to all of them. And on this ground it is, that Professor Marcus, of Bavaria, who has contended with similar strenuousness for the identity of fever and inflammation, has regarded all inflamed organs as equal causes; and is hereby enabled to account, which Dr. Clutterbuck's more restricted view does not so well allow of, for the different kinds of fever that are perpetually springing before us, one organ giving rise to one, and another to another. Thus inflammation of the brain, according to Dr. Marcus, is the proximate cause of typhus; inflammation of the lungs, of hectic fever; that of the peritonæum, of puerperal fever; and that of the mucous membrane of the trachea, of catarrhal fever: a view which has lately been adopted by several French writers of considerable intelligence, as an improvement upon the hypothesis of Broussais.*

The general answer, however, to pathologists of every description who thus confound or identify fever with inflammation, whether of a single organ or of all organs equally, is, that, though fever is commonly a symptom or sequel of inflammation, inflammation is not uncommonly a symptom or sequel of fevers. And hence, though post-obit examinations, in the case of those who have died of fever, should show inflammation in the brain, the liver, or any other organ, it is by no means a proof that the disease originated there, since the same appearance may take place equally as an effect, and as a cause: while a single example of fever terminating fatally, without a trace of inflammation in any organ whatever, and such examples are perpetually occurring, is sufficient to establish the existence of fever as an idiopathic malady, and to separate the febrile from the phlogotic divisions of diseases.†

* See M. Broussais' Examen de la Doctrine Médicale généralement adoptée, et des Systêmes Modernes de Nosologie, Paris, 1816. All the above observations by Dr. Good on the theory of Broussais, are new matter in the present edition, lately found among the author's MSS., and marked for insertion in this work.—Ed.

* M. Gaultier de Clanbry, vide Journ. Gén. de Médecine, Avr., 1823, and M. Tacheron, Recherches Anatomico-Pathologiques sur la Médecine Pratique, &c., 8vo., 3 tomes, Paris, 1823.

† "It is too generally imagined, that the pri-

"A fever, therefore," to adopt the language of Dr. Fordyce, "is a disease that affects the whole system; it affects the head, the trunk of the body, and the extremities; it affects the circulation, the absorption, and the nervous system; it affects the skin, the muscular fibres, and the membranes; it affects the body, and affects likewise the mind. It is, therefore, a disease of the whole system, in every kind of sense. It does not, however, affect the various parts of the system uniformly and equally; but, on the contrary, sometimes one part is much affected in proportion to the affection of another part."*—(*On Fever*, Dissert. i., p. 28.)

The result of the whole, as observed at the outset of this introduction, is, that we know little or nothing of the proximate cause of fever, or the means by which its phenomena are immediately produced. In the language of Lieutaud, applied to the subject before us, they are too often atrâ caligine mersæ; nor have any of the systems hitherto invented to explain this recondite inquiry, however ingenious or elaborate, answered the purpose for which they were contrived.*

From the proximate cause of fever, let us next proceed to a few remarks upon its REMOTE causes.

Dr. Cullen, who has striven so strongly and so ingeniously to simplify the former, has made a similar attempt in respect to the latter. He first resolves all remote causes into debilitating or sedative powers, instead of being stimulant, as they were formerly very generally considered, and as they are still regarded by many pathologists, and especially by those who contemplate fever and inflammation as identical. Whether this position of Dr. Cullen be correct or not, it was necessary for him to lay it down and to maintain it, or he must have abandoned his system of fever altogether, which supposes it to commence in, and be primarily dependant upon, debility.

These sedative or debilitating causes he reduces to two,—MARSH and HUMAN effluvia; to the former of which he limits the term miasmata, and the power of producing intermittent fevers, which, with him, include remittent;

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mary disease which induces fever is essentially local inflammation. The application of this doctrine to the early stage of fever, we hold to be not only at variance with facts, but dangerous as to the practical deductions to which it leads. We know that irritation, far short of inflammation, is sufficient to excite feverish indisposition, more particularly at those periods of life at which the vascular system is easily excited by apparently trivial, local, or sympathetic disturbance (for example, in infancy or childhood, by dentition, or intestinal irritation), and that this feverishness disappears when the cause is removed. The paroxysm of an intermittent is induced by the peculiar effect of a malarian poison; in this disease, the whole phenomena of fever are well marked; but certainly few will maintain, that the febrile disturbance is the consequence of local inflammation. There can be little doubt that the error alluded to may, in a great measure, be imputed to the attempts to discover the cause or nature of fever in the various local lesions which are observed in fatal cases. On the other hand, the important fact should ever be kept in view, that the primary disorder, whatever it may be, passes readily into inflammation, and that the lesions which arise in the progress of fever constitute the principal source of danger, and are in many instances the immediate cause of death."—Dr. Tweedie in Cyclop. of Pract. Med., art. FEVER.

* It is singular that Dr. Good, who has stated, with much ability and clearness, the theories of medicine which have successively prevailed, should have entirely omitted even a cursory notice of our distinguished countryman Dr. Rush, who may be justly ranked among those who have successfully elucidated, at least in part, some of the soundest principles of medical practice. On the subject of Dr. Rush's merits as a systematic theorist, we avail ourselves of a supplementary note by Dr. J. W. Francis, in the American edition of Dr. Brewster's Encyclopedia, Vol. xii., p. 741 "Dr. Rush has been noticed as one of the class of modern eclectics, we think, improperly. No author of late times has probably laboured more perseveringly than Dr. Rush in favour of a particular system, and throughout his numerous medical writings traces of his peculiar theory are always apparent. His system may probably be considered a modification of the doctrines of Dr. Brown, but ushered into the world under circumstances more favourable to its successful reception. In the advantages of preliminary learning and general science, in experimental research and practical acumen, Brown can stand in no competition with Rush: while the greater elaboration of his doctrines by the latter early began and continued to an advanced age; his extraordinary eloquence as a public teacher, in the then only frequented university of the American republic; and the popularity of his written productions, secured to him an ascendency and duration which the principles of Brown, popular as they once were, never attained. Dr. Rush, however, seldom permitted mere theoretical views to mislead his practice; and his contemporaries will bear witness, that his prescriptions were as prudent and judicious, as his speculations were ardent and adventurous. At the present day, when the pretensions of several medical universities in the country present nearly equal claims, the medical practice in the United States is far too various to exhibit the liveries of any particular sect. More recently, the doctrines of sympathy, as they are termed, have been ably illustrated and defended, in the Philadelphia school, by Professor Chapman; while the principles of the humoral pathology, as modified by the late researches in physiology, and the results afforded by animal chymistry, are advocated by the professor of the practice of physic in the New-York University.—(See Dyckman's Pathology of the Human Fluids.) These two theories may be deemed those most current among American physicians."—D.

* The following observations by Dr. Tweedie agree with those of Andral (Anat. Pathol., tom. ii., p. 211, &c., and Clinique Méd.). "In most cases of fever we can discover the existence of certain lesions, but these are too vague or indefinite to enable us uniformly to decide on the primary seat of the malady. It is more than probable, that, in what is usually called *idiopathic fever*, there is *alteration either of the solids or fluids*, although its precise locality cannot, in every case, be detected; but, *without disease in either the one system or the other, we maintain that fever cannot exist*."—Cyclop. of Pract. Med., art. FEVER.

while, to the latter, he confines the term contagions, and the power of producing continued fevers. It is true, he has found himself compelled to take notice of a few other powers, as cold, fear, intemperance in venery or drinking; but these he is disposed to regard as little or nothing more than sub-agents, or co-agents, scarcely capable of producing fever by themselves.

"Whether fear or excess be alone," says he, "the remote cause of fever, or if they only operate either as concurring with the operation of marsh or human effluvia, or on giving an opportunity to the operation of cold, are questions not to be positively answered; they may possibly of themselves produce fever; but, most frequently, they operate as concurring in one or other of the ways above mentioned."—(*Pract. of Phys.*, book i., chap. iv., sect. xcvii.) To cold, however, he attributes a power of engendering fever more freely than to the rest; "yet even this," says he, "is commonly only an exciting cause, concurring with the operation of marsh or human effluvia."—(Ibid., book i., chap. iv., sect. xcii.)

We shall find, as we proceed, that these complemental causes may admit of addition; as we shall also, that they more frequently exist as independent agents, than Dr. Cullen is disposed to allow. Yet, there can be little doubt, that the chief and most extensive causes of fever are human and marsh effluvia.

No great benefit, however, has resulted from endeavouring to draw a line of distinction between these two terms, and hence it is a distinction which has been very little attended to of late years. *Miasm* is a Greek word, importing pollution, corruption, or defilement generally; and *contagion* a Latin word, importing the application of such miasm or corruption to the body by the medium of touch.* Hence, there is neither parallelism nor antagonism in their respective significations; there is nothing that necessarily connects them, either disjunctively or conjunctively. Both equally apply to the animal and the vegetable worlds—or to any source whatever of defilement and touch; and either may be predicated of the other; for, we may speak correctly of the miasm of contagion, or of contagion produced by miasm. Hence, the latter term is equally applied by Sauvages to both kinds of effluvia: "Miasmata, tùm sponte in sanguine enata, tùm extus ex aëre, in massam sanguineam delata."—(*Nosol. Method.*, Cl. ii.; *Febr. Theor.*, sect. 79.) And it is not a little singular, and confirms the force of this remark, that, since the publication of the first edition, in which the remark may be found as at present, M. Monfalcon, an ingenious and learned advocate of the Broussais hypothesis, has specifically applied, in direct contravention of Dr. Cullen's explanation, the terms miasm and miasmata to those morbific effluvia alone which are thrown off from the *living bodies* of men and animals in a state of disease, the influence or pathological action of which on the human frame he denominates *contagion:* while the effluvia from marshes, swamps, privies, cemeteries, and other sources of decomposing animal and vegetable materials, he simply but specifically distinguishes by the name of *marsh effluvium*, and their pathological action by that of *infection*.—(*Histoire des Marais et des Maladies causées par les Emanations des Eaux Stagnantes*, &c., 8vo., Paris, 1824.)

In a work of practical information, it is hardly worth while to follow up the refinements of those writers who deny, and endeavour to disprove, the existence of contagion under any form or mode of origin.* Such speculations may be ingenious and very learned, and find amusement for a leisure hour in the closet; but they will rarely travel beyond its limits, and

* A distinction is sometimes made between a *contagious* and an *infectious disease;* the former being communicable only by contact with the patient, or with something that he has touched, or some palpable matter that has proceeded from him. Of this kind are itch, syphilis, cowpox, hydrophobia, elephantiasis, yaws, sibbens, the glanders, and, as is sometimes suspected, porrigo, and plague. *Infectious* diseases are those which a person may contract by merely being exposed to the patient's atmosphere. Some diseases are both *contagious* and *infectious*, being capable of propagation in both manners, as the smallpox, the chickenpox, scarlatina, and the measles. The earliest suggestion of the different modes in which contagious and infectious disorders are propagated, was made by M. Quesnay, in his Mém. sur les Vices des Humeurs.—(Mém. de l'Acad. Royale de Chir.) This author admits two species of contagion:—"The first consists in the communication of diseases, which extend from one body to another by their property of multiplying the cause that has excited them, and of multiplying themselves in other subjects by this augmentation of cause: smallpox is a manifest instance of this species of contagion." Quesnay's second form of contagion is characterized by "the communication of a spontaneous movement, that extends from one body to another susceptible of this movement." This he compares to the fermenting of dough, or the extension of putrefaction through flesh. As Baron Dupuytren has explained, in a valuable document on contagious diseases, it appears that some of them are transmitted through the medium of the air; such are measles and scarlatina, after attaining a certain stage. Others are communicated by contact, as, for instance, the itch; some usually require contact and friction: such is the venereal disease. Others, like the cowpox and hydrophobia, need inoculation, or insertion. Some can be propagated only in one manner: such are measles, scarlatina, the itch, the cowpox, and hydrophobia. Others may be communicated in several ways, as syphilis and smallpox, the first of which may be transmitted with and without friction, and by inoculation; and the second by inoculation, contact, or the medium of the atmosphere. Dupuytren errs, however, in stating that measles cannot be communicated by inoculation.—See Rapport fait à l'Institut en 1825, sur un Mém. de M. Costa relatif à l'Epidémie qui ravagea Barcelonne en 1821.—Ed.

* Lassis, Recherches sur les véritables Causes des Maladies Epidemiques appelées Typhus, ou de la Non-contagion des Maladies Typhoides, &c., 8vo., Paris, 1813. Maclean's Results of an investigation respecting Epidemic and Pestilential Diseases, &c., 2 vols., 8vo., 1817–18.

should they ever be acted upon, would instantly destroy themselves.

It is a question of more importance, whether we have yet the means of realizing the distinction between human and marsh miasmata,* which Dr. Cullen has here laid down, and which has been generally adopted, from the weight of his authority. All specific miasmata may be regarded as morbid ferments, capable of suspension in the atmosphere, but varying very considerably in their degree of volatility, from that of the plague, which rarely quits the person except by immediate contact, to that of the spasmodic cholera of India, which works its way, if it be really from a specific poison, in the teeth of the most powerful monsoons, despising equally all temperatures of the atmosphere and all salubrities of district, and travelling with the rapidity of the fleetest epidemy. They are of various kinds, and appear to issue from various sources, but we can only discriminate them by their specific effects. These are most clearly exemplified in the order of exanthems; in which, for some thousands of years, they have proved themselves to be of a determinate character in all parts of the world where they have been the subject of observation, differing only in circumstances that may be imputed to season, climate, and other external causes, or to the peculiar constitutions of the individuals affected. Thus, the miasm of smallpox has uniformly continued true to smallpox, and that of measles, to measles; and neither of them has, in a single instance, run into the other disease, or produced any other malady than its own.

But, can we say the same of the supposed two distinct miasms of marsh and human effluvia? It is equally true, that the former has never produced any other than intermittent fever, or the latter any other than continued? And is it also equally true, that each of these maladies adheres as strictly to its own character in every age, and every part of the world, as smallpox and measles; and that they have uniformly shown as strong an indisposition to run into each other? Dr. Cullen's system is built upon an affirmative to these questions. For it, in fact, allows but two kinds of fever, each as distinctly proceeding from its own specific miasm as any of the exanthems.

But this is to suppose what is contradicted by the occurrences of every day: which compel us to confess, that, while we cannot draw a line of distinction between marsh and human effluvia from their specific effects, we have no other mode of distinguishing them.

Some writers, indeed, have denied that intermittents, or rather the intermittents of marshlands, are produced by a miasm of any kind; for they deny that any kind of miasm is generated there; and contend, that the only cause of intermittents, in such situations, is air vitiated by being deprived of its proper proportion of oxygen in consequence of vegetable and animal putrefaction, combined with the debilitating heat of the autumnal day, and the sedative cold and damp of the autumnal night.—(*Currie, Trans. Amer. Phil. Soc.*) But this opinion is too loosely supported to be worthy of much attention. It is sufficiently disproved by the intermittent described by Sir George Baker, as existing in the more elevated situations of Lincolnshire, while the adjoining fens were quite free from it.—(*Medic. Trans.*, vol. iii., art. xiii.) And, in like manner, the severe and intractable intermittents, of whatever form or modification, that exercise their fearful sway from Cape Comorin to the banks of the Cavery, from the Ghauts to the coast of Coromandel, not unfrequently pass into a contagious type, and propagate themselves by contagion.—(*Report on the Epidemic Fever of Coimbatore, by Drs. Ainsly, Smith, and Christie.*) We have as much reason to suppose a febrile miasm in intermittents as in typhus; and, in some instances, they have been found as decidedly contagious. "That intermittent fevers," says Dr. Fordyce, "produce this matter, or, in other words, are infectious, the author (meaning himself) knows from his own observation, as well as from that of others."*

And, notwithstanding that it becomes us to speak with diffidence upon a subject, respecting which we are so much in want of information, I may venture to anticipate, that the evidence to be advanced in the ensuing pages upon the general nature and diversities of fever, will show that there is more reason for believing that the febrile principle, produced by marsh and human effluvia, is a common miasm, only varying in its effects by accidental modifications, and equally productive of contagion, than that it consists of two distinct poisons, giving rise to two distinct fevers, the one essentially contagious, as contended for by Dr. Cullen.†

* Johnson, Influence of Tropical Climates, &c., pp. 20, 21, 3d edit., 1822. Miasm still denotes, in the common language of the profession, only the exhalations of decaying vegetable matter, which are the exciting causes of intermittent and remittent fevers. As Dr. Elliotson has very justly observed, however, *marsh*-miasm is an improper expression: it generally comes from a marsh, but it may arise without the presence of any marsh at all. Hence the term *malaria* is frequently preferred.—Ed.

* On Fever, Diss. i., p. 117. Notwithstanding Dr. Good's arguments, the Cullenian doctrine still prevails. "It appears quite certain," says Dr. Elliotson, "that intermittent and remittent fevers are not contagious." If a person catch a disease by going to see a patient who is labouring under it, this is no proof that the disorder is contagious: for the patient may be in the very spot where he contracted it from local circumstances; and the visiter goes to the spot, and exposes himself to the same causes. In order to prove that a disease is contagious, there should be a sufficient number of instances of persons going from the place where they contracted the disease to a healthy part, and there giving it to others. On this point the reader will find valuable rules of evidence laid down by Dr. Alison (On Epidemic Fever, in Edinb. Med. and Surg. Journ., vol. xxvii.), and various judicious reflections by Professor Elliotson, in his Lectures delivered at the Lond. Univ., as published in Med. Gaz. 1831-2, p. 921.—Ed.

† Certain difficulties, in the adoption of this view of the subject, will be noticed when intermittent fever comes under consideration.—Ed.

In effect, we shall perceive, that this mysterious subject is capable of being, in some degree, more clearly elucidated and still farther simplified, than it has been by preceding pathologists.

In the decomposition of all organized matter, whether vegetable or animal, when suddenly effected by the aid of heat and moisture, an effluvium is thrown forth that is at all times highly injurious to the health, and, in a closely concentrated state, fatal to life itself. Thus, we are told by Fourcroy, that, in some of the burial grounds in France, whose graves are dug up sooner than they ought to be, the effluvium from an abdomen, suddenly opened by a stroke of the mattock, strikes so forcibly upon the grave-digger as to throw him into a state of asphyxy, if close at hand; and, if at a little distance, to oppress him with vertigo, fainting, nausea, loss of appetite, and tremors for many hours: while numbers of those, who live in the neighbourhood of such cemeteries, labour under dejected spirits, sallow countenances, and febrile emaciation.* This effluvium is from the decomposition of animal matter alone; but, the foul and noisome vapour that is perpetually blown off the coast of Batavia, and the stinking malaria that rushes from the southeast upon the Guinea coast, though loaded with vegetable exhalations alone, triumph in a still more rapid and wasteful destruction. The last peculiarly so, as being thoroughly impregnated with destructive miasm, while sweeping over the immense uninhabitable swamps and oozy mangrove thickets of the sultry regions of Benin, insomuch that Dr. Lind informs us, that the mortality produced by this pestilential vapour in the year 1754 or 1755 was so general, that in several negro towns, the living were not sufficient to bury the dead; and that the gates of Cape Coast Castle were shut up for want of sentinels to perform duty; blacks and whites falling promiscuously before this fatal scourge.

In this case, as in the preceding, the vapour is always accompanied with an intolerable stench from the play of affinities between the different gases that are let loose by the putrefactive decomposition; and hence it is impossible to affirm, that the mortality thus produced is the result of any single or specific miasm operating to this effect. But it shows us, that the general effluvium from the decomposition of all dead organized matter, whether animal or vegetable, is equally deleterious to health and life. "Its presence," says the judicious Dr. Jackson, "is often connected with something offensive to the senses,—to the smell, and, perhaps, even to the taste. A certain degree of salivation, nausea, sickness, and headache, is often occasioned by the exhalations of a *swamp*, or the air of an *infected apartment*, but febrile action is not ordinarily the immediate consequence. To produce fever a space of time is required, different according to circumstances."—(*Outline of the History and Cure of Fever*, part i., ch. iii., p. 104.) How far the decomposition of dead vegetable matter, though its effluvium prove thus injurious to the health of man, may *alone* be capable of exciting fever of any kind, may, perhaps, admit of a doubt; for, in the bogs or peat-mosses of Scotland, and, still more, those of Ireland, the inhabitants are exempt from agues, though the ooze extends in immense tracts.*

The decomposition, however, to which on the present occasion we are chiefly to direct our attention, is of a mixed kind; for the marsh and oozy soil of countries that are closely or have been long inhabited, is necessarily a combination of animal and vegetable matter.

If this decomposition take place slowly, as in cold or dry weather, and more particularly in a breezy atmosphere, not the slightest evil is sustained during its entire process. And hence, in order to render it mischievous, and particularly in order to render it capable of producing fever of any kind, it is necessary that it should be assisted by the co-operation of certain

* Elém. de Chimie, Art. Putréfaction de Subst. Animal., tom. iv. These facts prove nothing more than either the asphyxiating nature, or the general unfavourable influence of such effluvia on the human constitution, and not the existence of any specific miasm or contagion, capable of bringing on either intermittent or continued fever. On this subject the following observations are curious and instructive:—"That it is vegetable and not animal matter which produces ague, is proved by this circumstance, that no person has that affection from being exposed to the most intense animal exhalations. Thousands of carcasess are annually employed in many manufactories, and yet no person is known to contract an ague from them; indeed, so far from it, that the most crowded places generally escape intermittent fevers. That part of Rome inhabited by the Jews, and called the Judaicum, is full of animal filth, but it escapes ague, while the elegant streets in the neighbourhood suffer from it very severely. Malaria not being the produce of dead animal matter, or effluvia arising from living bodies, the more men and animals are crowded together, the less access is there for the malaria; and, indeed, it is generally supposed, that the addition of smoke of every description has a great tendency to prevent it."—(Professor Elliotson's Lect. at Lond. Univ., as published in Med. Gaz. for 1831-2, p. 895.) Further remarks on this point will be introduced when we come to intermittent fever, and here the editor will merely refer to the observations of M. Andouard, Recherches sur la Fièvre Jaune, and to various facts adduced by M. Brachet, of Lyons, in confirmation of the truth of the above view.—Archives Gén. de Méd., tom. ix., pp. 380, 381.—Ed.

* The following is the explanation of this circumstance, given by Professor Elliotson:—"There is one description of bog which does not produce malaria; but then there is no putrefaction; decomposition has taken place in a peculiar manner. The vegetable matter becomes carbonized, and there is not sufficient heat for putrefaction to occur; but, it is said, that when peat-moss is in a certain latitude, and on a certain level, it can putrefy, and then, I believe, ague does prevail. That peat-bog does not putrefy is shown by a fact stated on good authority, viz., that animal matter thrown into it will not putrefy; but, it is said, that where peat-moss is placed in other situations, where it is warmer, and upon a proper level for moisture, it will putrefy and produce ague, just as other kinds of vegetable matter do."—Lect. at Lond. Univ., Med. Gaz. 1831-2, p. 895.—Ed.

agents, many of which we do not seem to be acquainted with, but which, so far as we are capable of tracing them, appear to be auxiliary to the general process of putrefaction, as warmth, moisture, air, and rest or stagnation.

The simplest and slightest fever that is produced under the joint influence of these powers, is the intermittent: and we find these produced where their joint influence is but feeble, and where it exists, perhaps, in its lowest stage, as in the favourable climate of our own country; where we are not frequently overloaded with equinoctial rains, and have not often to complain of a sultry sky, or a stagnant atmosphere. Even here, however, we perceive a change in the character of the intermittent at different seasons: for while in the spring it usually exhibits a tertian type, in the autumn we find it assume a quartan. And as these can only be contemplated as varying branches of the same disease, we have thus far, at least, reason to regard it as produced by a common febrile miasm, modified in its operation by a variation in the relative proportion which its auxiliaries, known and unknown, bear to each other during the vernal and autumnal seasons: coupled, perhaps, with some degree of change, produced by the same seasons in the state of the human body.

If from our own country we throw our eyes over the globe, we shall find in every part of it where the same causes exist, that in proportion as they rise in potency, they produce a fever of a severer kind, more violent in its symptoms, and more curtailed in its intervals, till we gradually meet, first with no distinct intervals, and at length with no intervals whatever; and hence perceive the remittent progressively converted into intermittent and continued fevers. And that here we have still the same miasm, merely modified in its operation by the varied action of its auxiliary powers on the constitution of the individuals it attacks, is as clear as in the former case; because, in many attacks, we see different individuals, touched by the very same influence, exhibit all the varieties now alluded to, and intermittent, remittent, and continued fevers co-existing in every diversity of violence; commencing with either of these forms; keeping true to the form with which they commenced; or changing one form for another.* Such, as remarked by M. Devèze, was the course of the fever at Philadelphia in 1793 (*Traité de la Fièvre Jaune*, &c., 8vo., Paris, 1820); and such, according to M. Berthé, that of the southern provinces in Spain, in 1800 (*Précis Historique de la Maladie, qui a regnée dans l'Andalousie*, en 1800): and such was peculiarly the fact in the highly malignant yellow fever of Antigua, in 1816, as admirably described by Dr. Musgrave.—(*Medico-Chirurg. Trans.*, vol. ix., p. 32.)

This last disease first showed itself during sultry weather and a quiet atmosphere, in a swampy part of the island, among a ship's crew lately arrived, but from a healthy vessel, and themselves in good health on first landing. It soon spread widely, and at length indiscriminately in town and country, among all ranks, and conditions, and situations, blacks as well as whites, the oldest settlers as well as the newest comers. In some cases, the head was chiefly affected; in others, the stomach, the liver, or a still different organ. Hiccough and black vomit were common towards the close of the disease, though many died without it; and recovery was *no exemption* from a second attack.

Dr. Musgrave asserts further, that during the whole of this fatal epidemy, there was no instance of its being received by contagion. The argument, however, which he offers upon this subject is not quite convincing. Yet admitting the fact to be as he states it, we have an additional proof, if proof were wanting, firstly, that when the animal frame has been previously debilitated or relaxed, as in the case of a ship's crew that has been long voyaging in high latitudes, and living on salted provisions, it suffers sooner and more severely than where no such relaxation has taken place: and, secondly, that by a long and gradual exposure to the influence of febrile miasm, however produced, whether from the living human body or from dead organized matter, the animal frame becomes torpid to its action, as it does to the action of other irritants. Whence prisoners confined in jails with typhous miasm around them, as well as those who have long stood the climate in the West Indies, receive the contamination to which they are exposed far less rapidly than strangers, and are capable of communicating it from their clothes or persons to fresh men, without being in the least affected by it themselves; as appears to have been the case in various courts of justice, and particularly at the Black Assize at Oxford, in July, 1577; though Dr. Bancroft has endeavoured to explain this effect in another way.—(*Essay on the Disease called Yellow Fever*, &c., Lond., 1811.)

The argument, however, of Dr. Musgrave upon this point, we have said, is not quite satisfactory; because he admits that those who were about the patients, and paid no attention to personal cleanliness, did not wholly escape; but then, says he, they escaped *as generally*, and were *not more frequently* affected, than those who never entered the doors of an infirmary. Now, as all ranks and conditions, blacks and whites, even far off in the country, were affected indiscriminately, we have no reason to expect that those whose habits had rendered them peculiarly torpid to the action of the febrile miasm should be more frequently affected than others. The very admission that

* See Sir Gilbert Blane's valuable article on Yellow Fever, in his Select Dissertations, &c., p. 284, 8vo., Lond., 1822. All these facts may be true without proving that malaria alone will give rise to continued fever, except in a secondary, indirect manner, when the change of the intermittent fever to this type may be explained by reference to morbid visceral alterations, sometimes brought on by intermittent fever, and possibly also in hospitals, by taking into the account the influence of the effluvia from patients congregated in such buildings. A similar mode of reasoning would account for the variation of continued fever to the intermittent or remittent type, when the patient is exposed to malaria.—Ed.

they were as much so, seems to imply that the febrile miasm was attacking them in some new mode against which they were not guarded by previous habit. Nor is it easy to conceive by what means the local disorder of the coast could be converted into so extensive an epidemy, unless through the medium of contagion.

I have dwelt the longer upon this subject, because it is desirable to reconcile as much as possible, the conflicting testimony of respectable writers, who, having adopted different theories, are insensibly led to support them by inaccordant descriptions of the same disease.

In direct opposition to Dr. Musgrave, Dr. Jackson, Dr. Bancroft, and a host of distinguished writers who think with them, we are told by Dr. Pym, that the Bulam fever, admitted by Dr. Musgrave to be the same as the above, not only is contagious, but is never introduced into any fresh region but by contagion:* while Dr. Rush, speaking of the yellow fever of Philadelphia of 1793, asserts that "there were, for several weeks, two sources of infection, viz., exhalation and contagion. The exhalation," says he, "infected at the distance of three and four hundred yards, while the contagion infected only across the streets. After the 12th of September, the atmosphere of every street in the city was loaded with contagion." He adds, that a few caught the disease who had it before: thus taking a middle course between Dr. Musgrave, who tells us, that recovery affords "*no* exemption from a second attack," and Dr. Pym, who affirms that the fever "attacks the human constitution but once." In the fever of Cadiz of the year 1800, Sir James Fellowes, who coincides in the view adopted by Dr. Pym, asserts, not only that it was contagious, and propagated only by contagion, but that the air, "from its stagnant state, became so vitiated, that its noxious qualities affected even animals: canary-birds died with blood issuing from their bills, and in all the neighbouring towns which were afterward infected, no sparrow ever appeared."†

I do not remember to have seen this last fact so directly affirmed by any modern writer; but it is not contradicted in the course of the controversy, and is in perfect coincidence with the state of the air during the plague in most places (*Diemerbr. de Peste*, cap. vi.; *Van Swieten, ex prof. Sorbait*, in sect. 1407), and particularly at Athens, as described by Thucydides (*Hist.* xi., 52): τεκμήριον δὲ τῶν μὲν τοιούτων ὀρνίθων ἐπίλειψις σαφὴς ἐγένετο· καὶ οὐχ' ἑωρῶντο οὔτε ἄλλως, οὔτε περὶ τοιοῦτον οὐδέν. Οἱ δὲ κύνες μᾶλλον αἴσθησιν παρεῖχον τοῦ ἀποβαίνοντος, διὰ τὸ ξυνδιαιτᾶσθαι. Whence Lucretius, who does but little more than translate Thucydides:

"Nec tamen omnino temere illis solibus ulla
Comparabat avis, neque noxia secla ferarum
Exibant sylvis; languebant pleraque morbo,
Et moriebantur; cum primis fida canum vis
Strata animam ponebant in omnibus ægre:
Extorquebant enim vitam vis morbida membris."*

"Nor longer birds at noon, nor beasts at night
Their native woods deserted; with the pest
Remote they languish'd and full frequent died.
But chief the dog his generous strength resign'd,
Tainting the highways, while the ruthless bane
Through every limb his sick'ning spirit drove."

There can be, or rather there ought to be, no question, therefore, that the fever before us was in some regions contagious, or produced from human effluvium; as, in other regions, and under other circumstances, it was produced from marsh effluvium. And though from a prejudice of education that will presently be pointed out, the contrary is still contended for by names of considerable weight, they seem to be overbalanced in number as well as in authority by those who have enlisted themselves on the opposite side of the question; of which last it may be sufficient to set down the names of Lind, Clarke, Belfour, Chisholm, Blane, M'Grigor, and Johnson, from among our own countrymen; and of Berthé, Bequine, Dalmas, Bally, and Pugnet, among foreigners. The facts brought forward by Sir James M'Grigor upon this subject are decisive, indeed, of themselves. And those who are more voracious of proofs may satisfy the most exorbitant appetite by the numerous and conclusive narratives collected by Dr. Chisholm, and especially the fever described by Dr. M'Cabe (*Edin. Med. and Surg. Journ.*, Oct., 1819), as prevailing among the Royal York Rangers, stationed at Trinidad. "The causes of this fever in its origin were, excessive heat, marsh effluvia from a marsh of immense extent in the immediate vicinity of Port of Spain, considerable labour, and fatigue. Its contagious character superadded to its marshy was produced by an influx of Spaniards from the Spanish Main, in a deplorable state of misery and wretchedness. It was among these unfortunate people that the contagious fever began."—(*Climate and Dis. of Trop. Countries*, p. 42, 8vo., 1822.)

It is probable that Sir James Fellowes and Dr. Pym might contend that, in this quarter, the fever was imported, and maintained by contagion alone, as they have contended was the case in the yellow fever of Cadiz in the year 1808; but, even in this last case, they have completely failed in establishing the question of its supposed

* Observations upon the Bulam Fever, which has of late years prevailed in the West Indies, on the coast of America, at Gibraltar, Cadiz, and other parts of Spain, &c., 8vo., 1815.

† Reports of the Pestilential Disorder of Andalusia, which appeared at Cadiz in the years 1800, 1809, 1810, 1813, &c., 8vo., 1815. But, on the other hand, the reader should recollect what has happened subsequently with reference to the present question. In 1821, the city of Barcelona was visited by the yellow fever in a severe and extensively fatal character. Now, if the report of the French medical commission, sent out to investigate the nature of this disorder, be considered, and the facts related be admitted, the contagious nature of the fever must be recognised. But if the reader afterward turn to the valuable documents collected by Dr. Chervin, he will be convinced that the facts which led the commissioners to infer that contagion had been at work, are by no means conclusive; and he will be compelled to attribute the prevalence of the disease to *local* circumstances.—Ed.

* De Rer. Nat., lib. vi., 1117

importation by a ship's crew from Spanish America; and, as there is no doubt in the mind of those who have not buckled on the armour of controversy, that this fever was the common fever of the Mediterranean coasts, so well described by Dr. Cleghorn, and which, under different names and with different degrees of violence, commits its ravages mostly about the autumnal equinox, from the swampy shores of the Nile to the oozy banks of the Tiber, and which is often found as destructive in the Campania as in the East or West Indies, there should be no longer any doubt of the operation of one and the same miasm or febrile principle in all these cases; sometimes issuing from the effluvia of the living body, and sometimes from that of dead organized matter: generated, to adopt the language of Professor Frank, "tam in ægrotantium variorum corpore, quam in atmosphæra, plurimorum exhalationibus inquinata, favente anni constitutione" (*De Cur. Hom. Morb. Epit.*, tom. i., 8vo., March, 1792); and, consequently, that the whole of that part of Dr. Cullen's system is erroneous which supposes a different specific principle of fever to be generated in each; the one distinguished by being limited to the production of uncontagious intermittent fever, and the other to that of contagious continued fever. And it is of the more importance that the error of this doctrine should be pointed out, since it has proved the very groundwork of that altercation which has prevailed upon the subject before us. For the writers on both sides, having equally drunk from the Cullenian fountain, and being equally impressed with the truth of this doctrine, have only warred with each other in support of Dr. Cullen's distinction; and, hence, those who have so clearly witnessed the origin of the fever from marsh effluvium, that they have been compelled to acknowledge this as its source, have felt themselves compelled at the same time to deny that it is contagious; while those who have as clearly witnessed its contagious power, have as forcibly felt themselves compelled to deny that it has sprung from marshy miasm.

Dr. Jackson affords us one of the clearest proofs of the truth of this remark in his late, as well as in his earlier works. There is no writer who has more distinctly pointed out the close analogy between the symptoms of the marsh endemic of the West Indies, and contagious fever, as they very frequently show themselves, than he has done;—"The derangements," says he, "are exteriorly so much alike, that the discriminating characters cannot be delivered but with doubt and hesitation; the result of the whole appearances will often determine the judgment, but the symptoms, separately considered, lead to no certainty. The causes of endemic and of contagious fevers were equally connected, under certain conditions, with eruptions on the skin, ulcers of the extremities, diarrhœa, purging, dysentery, or flux, fever of an intermitting or remitting form, of a form continued,—violent and rapid in course, moderate and of ordinary duration, or slow, lurking, and irregular, ceasing and returning at intervals,—changing from general to local disease of various descriptions, and from local disease to general and formal fever. The general manner of attack, the course, changes, and duration of endemic and contagious fevers, have great similarity. Certain modes of action or combinations of action prevail more frequently in the one disease than the other, *but forms and modes do not constitute characteristic differences*; thus, affection of the stomach and biliary system, vomiting, and yellowness, are less frequent in contagious than in endemic fever; yet, they do occur in the former, and sometimes to considerable extent. Affection of the chest, alternating with delirium, or affection of the head, appears to be more common in contagious than in endemic fever; so likewise is a peculiar maniacal derangement or lively delirium, occurring in the progress to recovery: yet the frequency of these appearances *does not furnish a characteristic mark*."—(*History and Cause of Fever*, pp. 213, 214, 216.) That is to say, all the leading symptoms, which make and determine the diseases, are the same; and though practically and in fact they run into each other and are the same, yet speculatively and theoretically they are not the same, and never can run into each other in the opinion of this valuable writer, because Dr. Cullen has laid down the dictum, that intermittents must proceed from paludamiasm and be uncontagious, and contagious fevers from the morbid effluvium of animal bodies alone. Yet, after all, the substantive part of the tenet seems to be relinquished by Dr. Jackson in the following passage, which occurs in his remarks on the yellow fever that ravaged the Spanish coasts in 1800, notwithstanding the firmness with which the Cullenian doctrine is ostensibly maintained. "The case may perhaps be thus explained. The yellow fever, during the reign of epidemic influence, often *strikes like a pestilence by the mere concourse of people in a close place*; and if a mass of sick persons be collected into a hospital during the epidemic season, *the common emanations from the sick bodies*, whether saturated with contagious particles or not, *often act offensively on those who enter the circle*, and often appear to be the cause of the explosion of a disease, which, without accessory or changed condition of the medium in which man lives, would have probably remained dormant for a time, and perhaps for ever."*

In the typhus, or the fever that originates in crowded jails, and other thronged and noisome abodes, there is no longer a question concerning its human origin, or emanation from sick bodies, and its contagious property; at least, among practical writers. But typhus does not differ more widely in its symptoms from some of the modifications of the fever we have just contemplated, than such modifications do from others of the same fever, varied by the varying power of its co-operating agents.—(*Caizergues, Mémoires sur la Contagion de la Fièvre Jaune,*

* Remarks on the Epidemic Yellow Fever, &c., on the South Coasts of Spain, p. 44, London, 8vo., 1821.

Paris.) And hence we have reason to conclude, that typhus also is generated from the same common febrile miasm, modified in its action by influential contingencies.

In effect, the yellow fever itself, under peculiar circumstances, assumes something of a typhous character even in its first origin, and where the source has unquestionably been marsh miasm. The second form of the Andalusian fever, as described by Dr. Jackson, and especially characterized by defective energy, peculiarly exemplifies this remark; and such was expressly the case with the asthenic remittent at Breslaw in 1757 (*Chisholm, Manual of the Climate and Diseases of Tropical Countries*, &c., p. 38, 1822), as well as in the Island of Edam on the coast of Batavia in 1800, and is still oftener found in the remittent that takes place along the Gambia, after rain in the spring or early part of the summer; when there is less organized matter remaining on the surface of the earth to be decomposed, and what there is has been acted upon by a lower temperature and a shorter duration of heat than in the autumn. "In the month of June," says Dr. Lind, "almost two thirds of the white people were taken ill. Their sickness could not well be characterized by any denomination commonly applied to fevers: it however approached nearest to what is called a *nervous fever*, as the pulse was always low, and the brain and nerves seemed principally affected. It had also a tendency to frequent remissions." The patients were often attacked with a delirium, and ran into the open air, where they received benefit from an affusion of heavy rains upon their naked bodies. The delirium, however, it seems, "soon returned; they afterward became comatose, their pulse sunk, and a train of nervous symptoms followed; their skin often became yellow." And even where the disease commenced with symptoms of great excitement, and an intermittent type, it is so much disposed, under peculiar incidents, as great fatigue, disappointment, and short provisions, to run into a typhus fever, as at Walcheren,* and during the retreat of the British army to Corunna, that many nosologists have thought themselves called upon to make this form a distinct variety or even species of fever, which they have usually distinguished by the name of *typhus icterodes*, or yellow typhus.

In like manner, where the yellow fever has commenced originally from contagion, or, in other words, from a decomposition of human instead of marsh miasm, it has been under the very same auxiliaries of filth, poverty, crowded numbers, and a stagnant atmosphere, that give rise to typhus Thus, the fever of Malaga in 1803, uniformly admitted to be of the same kind as that of Cadiz in 1800, spread first, according to Professor Arejula's description, through the narrow, crowded, and offensive lanes of the district de Perchel; and that of Cadiz itself, according to Sir James Fellowes, made its earliest appearance in the Barrio de Santa Maria, a part of the town in which the streets are narrower, less ventilated and cleanly, than any other part, and where the poor inhabitants, dirty in their persons, and crowded in filthy rooms, generally live together. It is true, that it was conjectured by many persons, and among others by both these writers themselves, that the contagion did not originate in either of these situations, but was introduced into them by foreign shipping; but such a conjecture has, in the first place, no trustworthy evidence for its support; and, in the second, the mere testimony of the captain of the ship referred to was directly contradicted by the chief physician of the hospital at the Havannah, who was on board the whole time, and was privy to the cases in question. In effect, a cause thus secondary seems to have been superfluous; for the local causes, enumerated by Sir James Fellowes and Professor Arejula (*Brieve Descripcion de la Fiebre Amarilla*, p. 229, Madrid, 1806), appear to have been perfectly adequate. They are, as near as may be, the same as those which operate so fatally on the miserable and crowded cabins of Ireland; and if the fever had shown itself at a cooler season of the year, and the subjects of it had been still more broken down in constitution by mental dejection and low diet, it would probably from the first have assumed a continued and typhous character, instead of a remittent and more energetic. The proofs offered upon this subject, from personal and accurate observation, by Dr. Jackson and Dr. O'Halloran, are in full confirmation of this view; for there can be no doubt that the fever of 1820 and 1821, which they described, was the same as that of 1800 and 1803.

"From an impartial consideration," says Dr. O'Halloran, "of all the circumstances attending the epidemics of Spain in the year 1821, the conclusion is, I think, fairly deducible, that the disease was not, and is not occasioned by imported contagion, and that its origin cannot be attributed to the germe of a former epidemic, resuming original activity from the operation of a peculiar state of atmosphere, without which it would remain dormant, perhaps, for ever. All the towns and cities which suffered from the yellow fever, were, with the exception of Cadiz, filthy in the extreme, disgustingly so, and very objectionable on the score of ventilation, situation, and form of construction; while the different towns of Arens, Matero, Badalona, Tarragona, Vinaros, Benicarla, Valencia, Aliama, Velez, Malaga, Marabella, Estepona, Vejer, Conil, Puerto Real, Rota, Chipiona, Orcos, and Medina Sidonia,—all of which are in the vicinity of the sea, and which, it may be presumed from their relative situations, communicate freely with the theatres of disease, were not affected by the malady. They seldom, indeed, suffered in any other years; because, independent of

* Id. ibid. Here the change of an intermittent fever to typhus is accounted for by the author himself, without any necessity for having recourse to the hypothesis that the infectious principles of malaria from decaying vegetables, and of animal exhalations, may give rise occasionally either to continued or intermittent fevers. What is stated in the text merely proves, that a person labouring under ague, if exposed to fatigue, disappointment, certain privations, &c., may become typhoid.—Ed.

their localities, being better chosen for health, they are comparatively clean."*

The febrile miasm, then, generated by a decomposition of human effluvium and of dead organized matter, appears to be essentially the same, modified alone in one or two of its qualities by the co-operation of the heat, moisture, stagnant atmosphere, and perhaps some other unknown agents, that are necessary to give it birth or activity.

The chief difference produced in this miasm under these distinct modes of origin, is, that when generated by the decomposition of effluvium issuing from living human bodies, it is less volatile (*Hist. and Cure of Fever, by R. Jackson*, M. D., part i., chap. iii., p. 102), and has at the same time a power more directly exhausting, or debilitating the sensorial energy, than when generated by the decomposition of dead organized matter. Whence fevers, originating in jails or other confined and crowded scenes, contaminate the atmosphere to a less distance than those from marshes or other swamps, but act with a greater degree of depression on the nervous system when once received into it. Yet, even the latter have a definite atmosphere of action, beyond which they lose their power, and an atmosphere of a more limited diameter than we might at first be tempted to conceive: for, we learn from Sir Gilbert Blane, that, in the unfortunate expedition to Walcheren, the crews of the ships in the road of Flushing were entirely free from the endemic of the country, as were also the guard-ships, which were stationed in the narrow channel between Flushing and Beveland;—the width of which channel is only about six thousand feet.—(*Select Dissertations*, &c., p. 107.)

In whatever mode derived, the remark of my excellent and distinguished friend Dr. Hosack will still hold, not indeed that it is altogether incapable of taking effect in a pure atmosphere, but that "an impure atmosphere is indispensably necessary to extend the specific poison."† And I should also fully concur with him and Professor Brera‡ in censuring the application of the term *epidemic* to any of the febrile diseases hereby produced, provided this epithet were usually confined, which I am not aware of, to disorders supposed to result from some primary intemperament of the atmosphere itself; and provided also every attempt at distinction were not likely to perplex, rather than to simplify, a subject sufficiently intricate *ab ovo;* of which M. Devèse has furnished us with an ample specimen in his late treatise.—(Op. cit., p. 354.)

Why a corrupt state of the atmosphere should be necessary to the general action of the febrile miasm, is a question which still remains to be discussed. Dr. Hosack supposes that the latter "produces its effects by some chymical combination with the peculiar virus secreted from the diseased body," and which is floating in the atmosphere; of the nature of which virus, however, he has not given us any information: while Dr. Chisholm conceives that it is the impurity of the atmosphere itself, which operates by "increasing the susceptibility of the system to the action of the poison introduced."—(*Letter to Haygarth.*) But to this explanation Dr. Hosack successfully rejoins, "that the predisposition of those who are most exposed to such impure air is less, while those who reside in the pure air of the country, are most liable to be infected when exposed to the contagion."

In a pure atmosphere, the miasmic materials easily become dissolved or decomposed; but slowly and with great difficulty, perhaps not at all, in a corrupt atmosphere, already saturated with foreign corpuscles. In a state thus crowded, moreover, they less readily disperse, or ascend beyond their proper periphery of action, and, perhaps, by their tenacity, adhere to bodies more ponderous than themselves, and thus loiter for a still longer period within the stratum of human intercourse. And as it is from the same tenacity they adhere to various kinds of clothes and filth, we may easily perceive why, on the shaking or agitation of such substances, as in clearing a ship's hold, or unpacking its cargo, a pestilence may be generated of which the crew have hitherto given no signs.—(*Blane, Select Dissertations*, &c., p. 307, Lond., 1827.)

Upon this explanation it is not necessary to suppose that febrile miasm has a power either of concentrating its virulence (*Jackson*, ut supra, part i., chap. x., p. 246), so as to render itself more active, or of multiplying its own form, so as to increase its numerical strength; against both which views there are weighty objections. Every distinct particle thus suspended, and withheld from dissolution, becomes an active individual in the field of battle, and is almost sure to grapple with its man. So that hereby alone we have a force equal to any degree of mortality that can be conceived.*

* Remarks on the Yellow Fever on the South and East Coasts of Spain, &c. By Th. O'Halloran, M. D., &c., p. 184, Lond., 8vo., 1823. Dr. Haygarth believed that the contagion of fever is confined to a very narrow sphere (Letter to Dr. Percival, p. 8); and Dr. Clarke is of opinion, that the most malignant fever does not render the atmosphere infectious further than a few feet from the patient, or from the contagion retained in the clothes or furniture.—(Report of the Committee on the Newcastle Dispensary, 1802.) The plague is sometimes alleged to be infectious to so small a distance from the sick person, or infected articles, as almost to require contact for its propagation. It is probable, as Dr. Brown thinks, that these limits of the extent of the action of contagious disorders have been fixed with more minuteness, than facts altogether justify.—Ed.

† Obs. on the Laws governing the Communication of Contagious Diseases, 4to., N. York, 1815.

‡ De' Contagi e della Cura de' loro Effetti, Lezioni Medico-pratiche del Cavaliere Brera, M. D., &c., 2 vols., 8vo., Padua, 1819.

* While treating of this portion of our subject, we would again quote a note by Dr. Francis, in the Am. edition of Brewster's Encyclopedia, vol. xii. Dr. Francis remarks, "Much light has unquestionably been thrown on the subject of contagion and febrile infection, by American physicians. It was not, however, until 1796, that an

While, then, the remote causes of fever are of different kinds, its chief and most effective is febrile miasm; the origin and laws of which, so far as we are at present acquainted with it, may be expressed in the following corollaries:

1. The decomposition of dead organized matter, under the influence of certain agents, produces a miasm that proves a common cause of fever.

2. The whole of these agents have not yet been explored; but, so far as we are acquainted with them, they seem to be the common auxiliaries of putrefaction, as warmth, moisture, air, and rest, or stagnation.

3. The nature of the fever depends, partly, upon the state of the body at the time of attack; but, chiefly, upon some modification in the powers or qualities of the febrile miasm, by the varying proportions of these agents, in relation to each other, in different places and seasons. And hence, the diversities of quotidians, tertians, and quartans, remittent and continued fevers, sometimes mild and sometimes malignant.

4. The decomposition of the effluvium, transmitted from the living human body, produces a miasm similar to that generated by a decomposition of dead organized matter, and hence capable of becoming a cause of fever, under the influence of like agents.

5. The fever thus excited is varied, or modified, by many of the same incidents that modify the miasmic principle when issuing from dead organized matter; and hence a like diversity of type and vehemence.

6. During the action of the fever thus produced, the effluvium from the living body is loaded with miasm of the same kind, completely elaborated as it passes off, and standing in no need of a decomposition of the effluvium for its formation. Under this form, it is commonly known by the name of febrile contagion. In many cases, all the secretions are alike contaminated; and hence febrile miasm of this kind seems sometimes to be absorbed, in dissection, by an accidental wound in the hand, and to excite its specific influence on the body of the anatomist.

7. The miasm of human effluvium is chiefly distinguishable from that of dead organized

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attempt was made to distinguish between contagion and infection, and to arrange the diseases arising from these two sources. The author of this distinction was Dr. Richard Bayley, an eminent practitioner of New-York, whose views on this subject have been widely circulated in his own country and in England, and procured for him much reputation, though unfairly assumed as his own by Dr. Adams of London.—(See Bayley's Treatise on the Epidemic of New-York in 1795, and Adams on Epidemics.) In 1796 and 1797, Dr. Mitchill published his doctrines on the pestilential fluids, usually termed the Theory of Septon.—(See Duncan's Annals of Medicine and New-York Medical Repository.) In 1804, the late Dr. Edward Miller, of New-York, communicated to the public an essay, entitled, 'An Attempt to deduce a Nomenclature of certain Febrile and Pestilential Diseases from the Origin and Nature of their Remote Cause.' The miasma which excites yellow fever, and all the inferior grades of disease, termed remittents and intermittents, Dr. Miller contends, is emitted from dead animal and vegetable substances, immersed in a certain degree of moisture, and undergoing decomposition by means of solar heat. Hence, he observes, these diseases are found in the neighbourhood of low and swampy grounds, known to abound in this kind of filth, at that season when such filth is powerfully acted upon by heat; or they are found in large and crowded cities. On the other hand, the miasma of typhus, while it bears an obvious relation to that just described, exhibits also many important differences. Typhus, says Dr. M., is generally, and it is believed always, originally the pestilence of poverty, of low life, of crowded habitations, of personal and domestic filth. In the evolution of the miasma of typhus, the matter of perspiration, and, generally, of all the excretions of the human body, constitutes the material, and animal warmth supplies the degree of heat necessary to set loose the poisonous gas. In order to distinguish these two *miasmatic atmospheres*, the author resorts to the Greek language for suitable terms. 'That portion of air charged with miasmata exhaled by solar heat from the surface of swampy grounds, or from masses of filth overspreading the open area of cities,' to use the author's language, 'is denominated *atmosphæra koino miasmatica*; that portion of air charged with miasmata emitted from and surrounding the body, clothes, bedding, and furniture of persons immersed in the filth of their own excretions, and of those associated in the same family with them, accumulated, long retained, and acted on by animal heat, is denominated *atmosphera idio miasmatica*. Or, in other words, the koino-miasmatic atmosphere is that which is derived from a common or public mass of putrefying matter, expanded to the solar influence; while, on the contrary, the idio-miasmatic is derived from a personal or private source, being produced from the filth of individuals and their habitations, and diffused around them only for a small distance.'

"In July, 1808, Dr. Hosack, in a letter to Dr. Chisholm of Bristol, England, proposed a new theory on the laws governing the communication of contagious and infectious diseases. Those diseases which are communicable from one person to another, and are generally considered of a contagious or infective character, are distributed by Dr. H. into three classes. First, such as are communicated exclusively by contact; as itch, syphilis, sibbins, laanda Africana, framboesia, elephantiasis, variola, vaccina, and hydrophobia: secondly, such as are communicable by *contact* and the *atmosphere*; as smallpox, measles, chickenpox, hoopingcough, scarlatina, and cynanche maligna: thirdly, those diseases generally communicable only in an impure air; as plague, yellow fever, typhus in its different forms, and dysentery."

In 1824, was published the Elements of the Etiology and Philosophy of Epidemics, by Prof. Joseph M. Smith, of New-York. Dr. Smith considers the arrangement and terms proposed by Dr. Miller, which we have mentioned above, as the most valuable improvement which has been made in the classification of the remote causes of fever; but he has seen cases of fever arising from the intimate *union* of both these causes; from a combination of human effluvia with the exhalations of the soil. Dr. S. remarks, that this compound source of disease is highly interesting in a practical and scientific point of view, and is sufficiently distinct and well characterized to be ranked as a genus. He terms it Idio-Koino miasma.—D.

matter, by being less volatile, and having a power of more directly exhausting or debilitating the sensorial energy, when once received into the system. Whence the fevers generated in jails, or other confined or crowded scenes, contaminate the atmosphere to a less distance than the emanations from marshes and other swamps; but act with a greater degree of depression on the living fibre.

8. The more stagnant the atmosphere, the more accumulated the miasmic corpuscles, from whatever source derived; and the more accumulated these corpuscles, the more general the disease.

9. The miasmic material becomes dissolved or decomposed in a free influx of atmospheric air: and the purer the air, the more readily the dissolution takes place: whence, è contrario, the fouler as well as more stagnant the air, the more readily it spreads its infection. *

10. Under particular circumstances, and where the atmosphere is peculiarly loaded with contamination, the miasm that affects man is capable also of affecting other animals.

11. By a long and gradual exposure to the influence of febrile miasm, however produced, the human frame becomes torpid to its action (*Brera De' Contagi e della Cura de' loro Effetti*, &c., ut suprà, Padua, 1819), as it does to the action of other irritants: whence the natives of swampy countries, and prisoners confined in jails with typhous contamination around them, are affected far less readily than strangers; and, in numerous instances, are not affected at all.

12. For the same reason, those who have once suffered from fever, of whatever kind, hereby produced, are less liable to be influenced a second time; and, in some instances, seem to obtain a complete emancipation. *

It only remains to offer a few remarks upon the DOCTRINE OF CRISES; or that tendency which fevers are by many supposed to possess, of undergoing a sudden change at particular periods of their progress.

A sudden and considerable variation of any kind, whether favourable or unfavourable, occurring in the course of the general disease, and producing an influence on its character, is still loosely expressed by the name of crisis. The term is Greek, and pathologically imports a separation, secretion, or excretion of something from the body; which was in truth the meaning ascribed to it when first employed, agreeably to the hypothesis of concoction which we have just considered. The original hypothesis is abandoned; but the term is still continued in the sense now offered. "If the matter of the disease," says Professor Frank, "be expelled by some one convenient outlet in the skin, kidneys, bowels, or bloodvessels, the crisis is simple; if by several of these at the same time, it is compound; if the whole be carried off at once, it is perfect. If it be carried off at different times, it is a *lysis* (Op. cit., tom. i., *De Febr.*, p. 26), or resolution."

That changes of this kind are perpetually occurring in the progress of continued fevers, must, I think, be admitted by every experienced practitioner. Nothing is more common than to behold a patient suddenly and unexpectedly grow decidedly better or worse in the progress of a fever of almost any kind, and pass on rapidly towards a successful or an unsuccessful termination.

But the important question is, whether there be any particular periods in the progress of a fever, in which such changes may be expected? Hippocrates conceived there were: he endeavoured to point out and distinguish them by the name of critical days. Asclepiades and Celsus denied the existence of such periods; and the same diversity of opinion has prevailed in modern times.

It is not very easy to determine the point at the present day, and especially in our own country. For, first, fever, like many other complaints, may have undergone some change in

* In relation to this subject, it deserves attention, that certain other states of the atmosphere affect different contagious disorders in different ways: "the diffusion of plague, for instance, is favoured by a temperature high within a certain degree; while it is checked, if not altogether extinguished, by the cold of winter, and likewise by very high temperatures, such as the heat of certain parts of Africa in summer, as mentioned by Alpinus, and that of the Harmattan winds. Typhus, we know, prevails at low degrees of heat, as likewise do measles and scarlatina; and so, with regard to contagions in general, we find the effect of temperature on them varies in the case of different diseases. A moist and still atmosphere may, if we mistake not, be declared favourable to the propagation of all contagious disorders; while it is sometimes suddenly checked by strong commotions in the air, such as storms and hurricanes. But, besides these appreciable atmospheric states, which, in one way or another, influence the diffusion and action of the matter of contagion, there are conditions of the air favourable to its diffusion, or otherwise, of the real nature of which we are ignorant, beyond their influence over the propagation of the disease. It has occurred to every medical man to see diseases, justly considered contagious, unusually prevalent in one season compared with another, though there may have been no discoverable difference in the atmospheric states to explain this variety in their prevalence; and to see them, on the other hand, decline and finally disappear long before individuals, susceptible of the contagion, were scarce, and without there having been any appreciable change in the air to account for that in the state of the disease. This atmospheric peculiarity, to which the name *epidemic constitution* has been assigned, occasionally appears to possess a limited locality; for, we find a contagious disease prevailing in a town or village, while places in the neighbourhood escape, though there is a constant intercommunion between the infected and healthy districts: or, such a disease may spread extensively in one town, while, in another, similar as to the habits and characters of the population, and not remote in situation, it may exist, but be by no means so prevalent."—See Cyclop. of Pract. Med. art. CONTAGION.—ED.

* An extremely learned paper, on the comparative influence of vegetable and animal matter in generating disease, by Prof. U. Parsons, of Providence College, is published in the Am. Journ. of Med. Sc., vol. vii., p. 80.—D.

its progress from a like change in the nature of its remote causes, or in the constitution of man. And next, it seems to be generally allowed, that sudden transitions, whether regular or irregular, are more apt to take place in almost all diseases in warm, than in cold climates. On these grounds, it is probably a subject which will never become of great practical importance at home. Yet, it is well worthy of attention as a question of history, and one that may yet be of great importance to many parts of the world.

If we examine the phenomena of the animal economy, as they occur in a natural series, we shall find that they are in almost every instance governed by a periodical revolution. A man in a state of health and regular habits generally becomes exhausted of sensorial power within a given period of time, and requires a periodical succession of rest; his appetite requires a periodical supply; and his intestines a periodical evacuation. This tendency equally accompanies and even haunts him in disease; he cannot disengage himself from it. Gout, rheumatism, mania, rapidly and pertinaciously establish to themselves periods of return. The hemorrhoidal discharge often does this; and the catamenia constantly. The same occurs in fevers, but especially in intermittents; for the quotidian, the tertian, the quartan, have, upon the whole, very exact revolutions. And, though accidental circumstances may occasionally produce a considerable influence on every one of these facts, whether morbid or natural, the tendency to a revolutionary course is clear and unquestionable.

Now, although Hippocrates has not appealed to this reasoning, it forms a foundation for his observations: and, when stripped of the perplexities that encumber his writings upon this subject, partly produced by erroneous transcripts, and, in a few instances, perhaps, by his own irresistible attachment to the Pythagorean hypothesis of numbers, he may be regarded as laying down the following as the critical days of continued fever: the 3d, 5th, 7th, 9th, 11th, 14th, 17th, 20th; beyond which it is not worth while to follow the series; for it is not often that they extend further.

In other parts of his works he regards also the 4th and 6th, and even the 21st, as critical days; so that in the first week, every day, after the disease has fully established itself, evinces a disposition to a serious change; in the second week, every other day; and in the third week, every third day. It is not easy to determine why the 21st day should be a critical day, as well as the 20th. Various conjectures have been offered upon the subject: by some it has been regarded as a mistake in the Greek copy, and by others, as a piece of favouritism in Hippocrates for this number, in consequence of its being an imperfect one in the Pythagorean philosophy, as the commencement of a septenary.

De Haen, with rigid and patient assiduity, has put Hippocrates to the test upon these data; for he has accurately analyzed Hippocrates's own journal of the numerous cases of fever he has so industriously collected and recorded, and finds the positions, in most instances, to be strictly justified; and that out of 168 terminations of fever, not less than 107, or more than two thirds, happened on the days denominated critical, not reckoning the 4th, 6th, or 21st, and that the 4th and 6th were very frequently critical. There are a few anomalies; but it is not necessary to notice them, because they are easily referable to accidental causes, similar to those that retard or accelerate the paroxysm of intermitting fevers.

Now, admitting the Hippocratic table to be true, the continued fever, in its progress, is measured by the various types exhibited by intermittent fevers. Thus, the quotidian prevails through the first seven days; there is on each day a slight exacerbation, and no one day is more critical than any other. After this period, the tertian type commences, and runs through the ensuing week; the principal changes occur on the 9th and 11th days, and would occur on the 13th, but that the quartan type now assumes its prerogative; and the principal transitions, after the 11th, take place on the 14th, instead of on the 13th; on the 17th; and on the 20th. Dr. Cullen, who has examined this subject with great attention, and simplified it from many of its difficulties, directly asserts, that his own experience coincides with the critical days of Hippocrates. Dr. Fordyce, who scarcely does justice to Cullen upon other points, unites with him upon the present, and justly compliments him upon his ingenious examination and explanation of the Greek distribution of critical days; and Dr. Stoker of Dublin has arrived at a like conclusion, after what appears to have been a very patient, discriminating, and extensive inquiry.* It is, nevertheless, admitted on all hands, that the order of succession is far less distinct, as well as less regular, in cold, than in warm climates; and that it requires a thoroughly attentive and practised eye to notice these changes in our own country, or, indeed, in any part of northern Europe. And hence Craanen says, it is lost time to look for them (*De Homine*); Stoll, that they are only to be found in inflammatory fevers (*Rat. Med.*, part iv., p. 283); Le Roy, that the supposed critical days have no influence, and can lead to no prognosis or peculiarity of practice (*Du Pronostic dans les Maladies Aigues*, 8vo., Montpel., 1778); and Frank, that nature has fixed upon no one day rather than another, for a solution of fever, nor at any time forbids our attempt at executing a present indication.—(Op. cit., tom. i., 29.) Dr. Jackson, partly from the strength of his attachment to the doctrines of Cullen, and partly from having principally practised in hot climates, is a great advocate for the existence of critical days, and believes them to take place in fevers from human as well as marsh miasm; though less distinctly, as also less frequently, in the former than in the latter.—(Op. cit., part ii., ch. ix., p 242.) Why the first week of a fever should

* Medical Report of the Fever Hospital, &c. for 1816. Trans. of the King's and Queen's Coll., Dubl., vol. ii., p. 434, 8vo., 1824.

incline to a quotidian type rather than to a tertian, or the second to a tertian rather than to a quartan, we know no more than we do why fevers should ever intermit, or at any time observe the distinctions of different types. We are in total ignorance upon all these subjects. We see, moreover, that intermitting fevers, whether quotidian, tertian, or quartan, have their paroxysms recur regularly in the daytime; the quotidian in the morning, the tertian at noon, and the quartan in the afternoon—and that, in no instance, do the paroxysms take place at night: and we see also that, in continued fevers, the exacerbations uniformly take place later in the day, than the paroxysms of the latest intermittent; for these rarely occur later than between five and six o'clock in the evening, while the paroxysms of the quartan return commonly before five. Of these interesting and curious scenes we are spectators; but we are nothing more; for we are not admitted to the machinery behind the curtains.

By some pathologists, the source of these phenomena is sought in the influence of the heavenly bodies, and especially in those of the sun and moon. In ancient times, these luminaries were supposed to produce an effect on all diseases, and especially on mania, epilepsy, catamenia, and pregnancy. And when the Newtonian philosophy first illumined mankind with the brilliant doctrine of universal attraction, Dr. Mead stepped forth into the arena, and revived and supported the ancient doctrine with great learning and ingenuity: and as an ingenious conjecture and possible fact, of which no practical use could be made, it was contemplated till towards the close of the last century: about which time Dr. Darwin, by interweaving it with his new hypothesis, once more endeavoured to raise it into popular notice, and gave it an air of serious importance. Dr. Balfour, of British India, however, has still more lately brought it forward as a doctrine capable of direct proof, and as peculiarly affecting the progress of fevers. His opinion, which he endeavours to support by weighty facts and arguments, is, that the influence of the sun and the moon, when in a state of conjunction, which is named sollunar influence, produces paroxysms or exacerbations in continued fever, in all cases in which a paroxysmal diathesis (for such is his expression) exists; and as this influence declines, in consequence of the gradual separation of these luminaries from each other, and their getting into a state of opposition, a way is left open to the system for a critical and beneficial change, which is sure to take place, provided the critical disposition is at this time matured. In other words, paroxysms and exacerbations in fever may be expected to take place (and do in fact take place) at spring-tides, and crises at neap-tides.

This is a new view of the influence of the heavenly bodies upon the human frame; and a view which, though feebly supported by facts, is advanced with all the dogmatism of an established science. Dr. Stoker, at the particular request of Dr. Balfour, put his doctrines to the test of 276 patients between July 6 and September 6, 1817, in Dublin. He has candidly given us his tables, and as candidly observes, that "very little coincidence indeed is to be remarked from a view of these tables."—(*Trans. of the King's and Queen's Coll.*, Dublin, vol. ii., p. 435, 8vo., 1824.) There is, nevertheless, more in medical astrology than is, perhaps, generally supposed; it is an important branch of meteorology, and, as such, is well worth studying. Nor can there, I think, be a question in any impartial mind, that, *under certain circumstances*, and especially in tropical climates, many diseases are influenced by lunation, as we are sure they are, in all climates, by insolation. The concurrent observations of a host of candid and attentive pathologists, who have been witnesses of what they relate, are sufficient to impress us with this belief: but, till we know more fully what these *circumstances* are, we cannot avail ourselves of their remarks, and can only treasure them up as so many isolated facts. And hence, in no age or country whatever has the study been turned to any practical advantage, expedited the cure of a disease, or enabled us to transform the type or interval of one kind of fever into that of another. Nor is it any exclusive reproach to the art of medicine that it should be so; for, of all the subdivisions of general philosophy, there is none so little entitled to the name of a science as meteorology itself. And, till the naturalist has explained the variations of the barometer, the physician need not blush at being incapable of turning to account the supposed influence of the planets, or of unfolding the origin, or tracing the capricious courses, of epidemics and pestilences.*

* It is remarked by Dr. Copland, that, since the overturn of the humoral pathology, the doctrine of critical evacuations has undeservedly fallen into disrepute. In our own country, at the present time, he thinks too little attention is paid to these evacuations, and still less to the periods at which they occur. "In temperate climates, a number of diseases, particularly fevers, run on for certain periods with regularity, and, after an exasperation of the symptoms, or some violent perturbation of the economy, terminate by evacuations of different kinds, which tend to remove the train of morbid actions, and to restore the healthy functions. In other cases, the exasperation of the disorder is followed by imperfect evacuations, occurring in a regular manner; while, in some, it gives rise to additional phenomena of a dangerous or fatal character. Hence *crises* have been denominated *salutary*, *complete*, *imperfect*, and *fatal*"—(Dict. of Pract. Med., art. Crises.) Yet, it has been observed, that the crisis of fever often takes place without sensible evacuation; notwithstanding it is, in a large proportion of cases, preceded or accompanied by some change in the secretions, or by diarrhœa, or hemorrhage. In the progress of fever, the urine exhibits particular changes. In the early stages, its quantity is lessened, but there is no change in its colour or chymical properties. "As the symptoms advance, the urine becomes darker in colour, but does not deposite a sediment till the fever begins to decline, when it is increased in quantity, and deposites a cloud or sediment on cooling. This urinary deposite, which is sometimes copious, appears to the bottom of

GENUS I.

EPHEMERA.

DIARY FEVER.

ONE SERIES OF INCREASE AND DECREASE; WITH A TENDENCY TO EXACERBATION AND REMISSION, FOR THE MOST PART APPEARING TWICE IN TWENTY-FOUR HOURS.

THIS is the simplest form in which fever at any time makes its attack; and hence, Dr. Fordyce has distinguished it by the name of SIMPLE FEVER. It is probably that which is intended by the term *essential fever*, as used by the French writers. It is, in truth, the basis of all other fevers, which are hence arranged by Elsner as mere species of this.—(*Beyträge zur Fieberlehre*, Konigsb., 8vo., 1789.) For the purpose, however, of entering into the full character, not only of the present, but of all the subsequent genera, and their respective species, it is necessary to bear in mind, that the ordinal definition forms a part of that character, and is essentially included, in a less or greater degree, in all the subdivisions that appertain to it.

The ephemera rarely exceeds a duration of twenty-four hours. Some practitioners, however, have called by this name a fever that has extended to three days; and Sauvages has arranged this mode of fever under his own genus of ephemera, as has also Professor Frank, distinguishing the proper ephemera by the adjunct *simplex*, and its elongated form by that of *protracta*.—(*De Cur. Morb. Hom. Epit.*, tom. i., pp. 156, 185, 8vo., Mannh., 1792.) But this is to confound different species under one generic name. Fordyce asserts, that he has often seen the ephemera commence its attack with all the essential appearances of fever, and terminate in eight, ten, or twelve hours.—(*On Simple Fever*, Diss. i., p. 33.) And hence, in defining ephemera, the symptom of duration ought not to exceed the limit here allotted to it.

In this simple shape of the disease, the pathognomonic symptoms are few and striking; for, however violent, it is confined to a single paroxysm of three distinct stages, shivering or languor, heat, and perspiration; each most probably dependant on the other, and ceasing, when true to itself, after having followed up the movements of the animal frame through a single diurnal revolution. The cold stage, however, is often scarcely perceptible, and sometimes altogether imperceptible, the general languor taking place without it.

The genus exhibits two common and very distinct species; and if the ephemera *sudatoria* of Sauvages, the sweating-sickness or English plague of other authors, be regarded as belonging to it, as unquestionably it ought, it will then afford us another after the manner following:—

1. Ephemera Mitis. Mild Diary Fever.
2. ——— Acuta. Acute Diary Fever.
3. ——— Sudatoria. Sweating Fever.

SPECIES I.

EPHEMERA MITIS.

MILD DIARY FEVER.

WITHOUT PRECEDING RIGOUR; LASSITUDE AND DEBILITY INCONSIDERABLE; PAINS OBTUSE, CHIEFLY ABOUT THE HEAD; HEAT AND NUMBER OF THE PULSE INCREASED SLIGHTLY; DRYNESS OF THE TONGUE AND FAUCES; TERMINATING IN A GENTLE PERSPIRATION

THE common exciting causes are, excess of corporeal, and especially of muscular exertion; long-protracted study; violent passion; suppressed perspiration; sudden heat or cold.

There are few persons who have not felt this species of diary fever at times, from one or other

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the vessel some hours after the urine has been voided: from its resemblance to brickdust it has been called *lateritious*, and by evaporation it may be collected in minute crystals of lithate of ammonia. This sediment is by no means peculiar to patients labouring under fever, but is often observed in the urine of healthy persons, or in that of others, whose function of digestion is impaired. In other instances, the sediment is of a pinkish white colour, and to this deposite, which, according to Dr. Wilson Philip, consists of the phosphates of the urine, the term *furfuraceous*, or *branny*, has been given. He regards both these urinary deposites as indications of returning health, and particularly of a renewal of a free secretion by the skin, which, in fevers, is generally a favourable symptom. In some fevers, terminating favourably, there is an unusual tendency to sweat, which only exhausts the strength. In these the furfuraceous sediment is observed, but without removing the fever: this is the case in hectic fever."—(Cyclopædia of Pract. Med., art FEVER.) Among other remarks made by Dr. Tweedie, he says, that when the sweating is so profuse as to induce exhaustion, or when it is partial or clammy, it is unfavourable; and though as a general rule critical sweats should not be interfered with, yet, if the strength be evidently lowered by them, or if there be not a corresponding amendment in the general symptoms, they should, if possible, be checked. When moderate diarrhœa comes on towards the termination of fever, it is generally a favourable circumstance, and ought not to be stopped. When there has been a disposition to relaxation of the bowels throughout the disease, which is not uncommon in some epidemics, and at particular seasons, the irritation commonly subsides spontaneously. Should it even continue through the period of convalescence, provided it do not interfere with the recovery of the patient, it is only necessary that the diet and general management be regulated. When the diarrhœa appears to retard recovery, and produce gradual emaciation, the practitioner should never lose sight of the possibility of the affection being the result of inflammation of the mucous membrane of the bowels, or of other intestinal lesions, and therefore requiring the most vigilant care. Dr. Tweedie has not met with hemorrhage as a crisis of fever: he has, indeed, seen hemorrhage from the nose, when there was considerable cerebral affection, and always remarked great relief from the evacuation; but he has never known an instance in which the fever disappeared with epistaxis. In typhoid fevers, hemorrhage from mucous surfaces and from the skin (*petechiæ*) is not unusual; but, according to Dr. Tweedie, they are never critical: they reduce the patient still more, and always indicate a severe, if not a fatal, form of fever. —ED.

of the causes just enumerated. When a man has worked himself up into a violent and long-continued fit of wrath, whether there have been reason or no reason, and more especially in the latter case; when he has taken a long and fatiguing journey on foot, walking with great speed, and suffering beneath great heat and perspiration; or when he has devoted the whole of the day to a particular study, so profound and abstracting as to exhaust almost the entire stock of sensorial power that can be drawn from other parts of the system at the single outlet of the attention;—and when beyond this he still urges his abstruse and protracted train of thought into a late hour of the night or the morning—there is a general irritation or undue excitement produced, that simple rest cannot at once allay; his sleep is short, hurried, and interrupted, if he sleep at all; he yawns, stretches his limbs, turns himself again and again in his bed for an easy, perhaps for a cool place, for his skin is hot and dry; but for a long time he turns in vain. The morning strikes upon his eyes, but he has had little sleep, and no refreshment: he is indisposed to leave his bed; and if he rise, he is still feverish, and unfit for business. He passes the day in disquiet, which perhaps increases towards evening; but at night he feels a moisture breaking forth over his skin, and comfortably succeeding to the heat and dryness that have thus far distressed him; he recovers, perhaps, even while sitting up; but if, as he ought to do, he goes to an early bed, a quiet and refreshing sleep supervenes, and he wakes to the health he before possessed.

It is not easy to explain why the febrile paroxysm should be more disposed to close its career sometimes towards the evening, but more generally later at night, except for the reason, whatever that reason may be, that all fevers are far more apt to commence their paroxysms in some part or other of the daytime, and especially intermittents, and consequently to drop them as the day declines. Thus the quotidian makes its assault in the morning, the tertian at noon, and the quartan in the afternoon: as though the diurnal revolution were somewhat regularly divided between febrile attack and febrile cessation or truce. It is possible, indeed, that a fever of any kind may open its onset at any hour; but this is so contrary to the ordinary rule, that Dr. Fordyce affirms, from his own observation, that ten fevers commence in the day to one at night.

The species before us forms scarcely a case for medicine: since nature, or that instinctive power which is ever operating to the general welfare of the animal frame, will be usually found competent to its object. So that if any thing remedially is attempted, it should be confined perhaps to abstinence from animal food, a slight increase of the peristaltic action of the intestines by a dose of neutral salts, and to a removal of the dry heat of the skin by diluents and small doses of ipecacuanha, which combines admirably with most aperients, and increases their power, while its own diaphoretic quality continues at least undiminished, and is often improved. This is now well known, though not a discovery of recent date; for Gianella, Vater, and various writers of credit, strongly recommended the same from personal experience nearly a century ago.*

Gamesters, after sitting up all night, and being worked up to madness by the chances and reverses of their ruinous stakes, are peculiarly subject to this species. A very cold and wet towel, tied round the temples, seems to give some check to the violent excitement of the brain; but, in the long run, I have generally found persons who have adopted this practice become debilitated and dropsical, and sink into an untimely grave, or creep on miserably through the fag end of a lingering life, that affords no retrospective comfort, with a hospital of diseases about them. But whether this proceed from the practice adverted to, or from the habitual exhaustion which naturally accompanies a course of gambling, may admit of a doubt.

SPECIES II.

EPHEMERA ACUTA.

ACUTE DIARY FEVER.

SEVERE RIGOUR; GREAT HEAT; PULSE AT FIRST SMALL AND CONTRACTED, AFTERWARD FULL AND STRONG; PERSPIRATION COPIOUS; GREAT LANGUOR.

In a few instances the accession is slightly marked, and there is little chilliness or rigour. The heat that succeeds, however, is always considerable; the face is red and bloated; and there are often pungent and throbbing pains in the head, corresponding with the pulsations of the arteries; though at times the pain in the head is dull and heavy. The high-coloured urine deposites a sediment with a tinge of orange-peel.

We cannot always trace the remote causes of this species; but it is usually produced by some morbid affection of the stomach, or of the collatitious viscera.

The most obvious and common cause is that of a surfeit, whether of eating or drinking: and there is no great difficulty in interpreting the means by which this cause operates.

The stomach, in the language of Mr. J. Hunter, is the great seat of general sympathy, and associates with almost every other organ in its action. The digestion of even an ordinary meal is a work of some labour to it, and especially in weakly constitutions; a greater degree of heat is regularly expended upon it during this process, and unquestionably also a greater degree of sensorial power; both which are taken from the system at large as from a common stock; and the consequence is, that in infirm habits, a considerable degree of chill and debility is felt during this process, and other organs become torpid while the stomach is in a state of increased action. Hence infants and old persons sleep during digestion; delicate females

* Gianella, De admirabili Ipecacoanhæ Virtute in curandis Febribus, &c., Patav., 1754. Vater, Diss. de Ipecacoanhæ Virtute febrifugâ, &c., Witeb., 1732.

feel a coldness shooting over their extremities; and those of irritable fibres become flushed in the face, and show other signs of irregular action. Now, if this be the case in the digestion of ordinary meals, what disturbance may we not expect during the digestion of a meal that overloads the stomach, and with which the stomach is incapable of grappling! what more especially, when at the same time, by an immoderate use of wine or spirits, the brain becomes exhausted of its energy by the excess of stimulus applied to it! The general chill over the surface, which, in the digestion of an ordinary meal, is only felt by the weak and delicate, is here often felt severely, and sometimes amounts to a horripilation. The first stage of fever is hence produced; and as the heat and perspiration are most probably a necessary result of the first stage, a foundation is hereby laid for the entire paroxysm. With the reaction that ensues a greater degree of sensorial power returns; the general frame as well as the brain is roused to an increased energy; the diaphragm and its associate muscles instinctively or remedially contract, and the stomach disgorges its contents, or thrusts them forward half digested into the duodenum.*

The only and well-known mode of cure consists, in the first place, in imitating the above natural process of relief; in unloading the stomach of its mischievous freight by a powerful emetic, and the alvine canal of whatever portion of the heating and crapulous mass has passed into it, by a brisk cathartic. The fever hereby excited will often subside in a diurnal revolution, and no tendency to a return of the paroxysm be produced.

If the species before us, however generated, do not subside within this period of time, or a few hours beyond it, the disease becomes a causus, or inflammatory fever of the continued kind, and consequently belongs to the genus ENECIA.

There are, however, a few exceptions to this rule; for Forestus gives a case, in which the paroxysm led to a fatal hectic (Lib. i., obs. 7): and Borelli gives another of equal singularity, in which it kept true to a triennial revolution, returning punctually once every three years.—(Cent. ii., obs. 100.)

SPECIES III.

EPHEMERA SUDATORIA.

SWEATING FEVER.

TENSE PAINS IN THE NECK AND EXTREMITIES; PALPITATION; DYSPNŒA; PULSE RAPID AND IRREGULAR; HEAT INTENSE; INTOLERABLE THIRST; DROWSINESS OR DELIRIUM; EXCESSIVE SWEAT.

I HAVE followed M. de Sauvages in introducing sweating fever, the *Ephemera maligna* of Borsieri (*Institut. Med. Pract.*, 8vo., 4 tomes, Ven., 1782–5), or Burserius, as he is more commonly called, and the *sudor Anglicus* of most foreign writers, into the present place.

Dr. Caius, who practised at the time of its appearance at Shrewsbury, and has written one of the best accounts of it extant, calls it "a contagious pestilential fever of one day. It prevailed," says he, "with a mighty slaughter, and the description of it is as tremendous as that of the plague of Athens." And we are told by Dr. Willis, "that its malignity was so extreme, that as soon as it entered a city it made a daily attack on five or six hundred persons, of whom scarcely one in a hundred recovered." It was certainly a malignant fever of a most debilitating character, but without any tendency to buboes or carbuncles, as in the plague; though, during some parts of its career, as fatal. It ran its course in a single paroxysm (*Holinshed*, vol. viii., 4to., Lond., 1808); the cold fit and hot fit were equally fatal; but, if the patient reached the sweating fit, he commonly escaped.

Hence, the cure consisted in exciting the sweating stage as quickly as possible, and in supporting the system with cordials throughout the whole of the short, but vehement course of the fever. At Shrewsbury, it continued to rage for seven months, and, during that period of time, a thousand fell victims to its violence. But after the discovery of the benefit of the sweating plan, it was certainly far less fatal.

It made its first appearance in London in 1480 or 1483: Caius says, in the latter year, first showing itself in the army of Henry VII., on his landing at Milford-Haven. In London, to which, however, it does not seem to have travelled till a year or two afterward, it took up its abode, with various intermissions of activity, for nearly forty years. It then visited the continent, overran Holland, Germany, Belgium, Flanders, France, Denmark, and Norway; among which countries it continued its ravages from 1525 to 1530: it then returned to England, and was observed for the last time in 1551.

It commenced its attack with a pain in the muscles of the neck, shoulders, legs, or arms, through which a warm aura seemed to creep in many instances; and after these symptoms, broke forth a profuse sweat. The internal organs grew gradually hot, and at length burning, the pungent heat extending to the extremities; an intolerable thirst, sickness, and jactitation followed speedily, occasionally with a diarrhœa, and always with extreme prostration of strength, headache, delirium, or coma, and a wonderful wasting of the whole body. The sweat was

* With respect to the hypothesis, that the heat and nervous influence of the whole system are diminished during digestion, because a part of the general stock is then withdrawn to the stomach, it is scarcely necessary to remark, that it is as improbable as it is destitute of proof. The various circumstances which in the preceding paragraph are fancied to prove or illustrate it, only show that languor, chilliness, and flushings of the face occasionally take place during the process of digestion, which also sometimes causes a tendency to sleep. These facts, particularly the flushings, constitute so weak a support for the doctrine, that they need no serious refutation. Why should we not here be content with the simple truth, that excesses at table frequently give rise to ephemeral fever?—ED.

tenacious, saburral, and of an offensive smell; the urine thick and pale; the pulse quick, often irregular; and the breathing laborious from the first. The modes of treatment were often puerile, and offer nothing instructive. A good constitution, and exposure to free air, seem to have been most successful in promoting a cure.

Dr. Caius asserts, that a thick noisome fog preceded the distemper, especially in Shropshire, and that a black cloud uniformly took the lead, and moved from place to place; the pestilence in a regular march following its direction.—There may be some fancy in this: but it is an unquestionable fact, that the most fatal pestilences of ancient and modern times have been ushered in by stinking fogs or mists, or some other intemperament of the atmosphere, of which the reader will find various instances in the sequel of this work.

The disease is generally, however, supposed to have been produced by inclement harvests and vitiated grain, particularly wheat, which is less hardy than other grains, and sooner infested with albigo (mildew), ustilago (smut), and clavus (ergot or spur). And, in proof that this last was the actual cause, it is observed by Dr. Willan, that the contemporary inhabitants of Scotland and Wales, who fed on oaten or barley, instead of on wheaten bread, were not affected. Nevertheless, whatever was the primary cause, a peculiar miasm or contagion seems to have been generated by the disease itself, which chiefly contributed to its spread and continuance. For we are told concurrently by all the writers, that Englishmen, who withdrew from their own country into France and Flanders with the hope of escaping the attack of the disease, fared no better than their countrymen at home: to which Dr. Freind adds, that, while Englishmen abroad were thus subject to the contagion, foreigners, and even the Scotch in England, were rarely or never seized with it (*Hist. of Physic*, vol. ii., p. 533); a feature that has been copied by Dr. Armstrong in his very forcible description of the complaint, which is perhaps better adapted for poetry than for sober prose.

"Some, sad at home, and, in the desert, some
Abjured the fatal commerce of mankind;
In vain: where'er they fled, the fates pursued.
Others, with hopes more specious, cross'd the main,
To seek protection in far distant skies;
But none they found. It seemed the general air,
From pole to pole, from Atlas to the East,
Was then at enmity with English blood:
For, but the race of England, all were safe
In foreign climes; nor did this fury taste [ed."*
The foreign blood which England then contain-

Something may, perhaps, be set down to the score of a national diathesis; but, without examining very closely into the accuracy of this wonderful part of its history, we may at least indulge a hope, that this peculiar, most virulent, and fatal contagion, has long since worn itself out, and become decomposed; though it may be still only latent, and waiting for its proper auxiliaries, once more to show itself in the field. —(*Navier, Maladies Populaires*, &c.)

* Art of Preserving Health, b. iii.

It is said, indeed, by Dr. Coste, the learned editor of Dr. Mead's works in French, that the disease continued to manifest itself occasionally as an epidemic in Picardy; but that, instead of terminating in a single day, it ran on to the third, fifth, and sometimes even to the seventh. It is hence sufficiently obvious, that the two fevers, though possessing many points of resemblance, are not precisely the same. Yet M. Bellot, in his thesis "An febri putridæ Picardi SUETE dictæ, sudorifera?" has maintained Dr Coste's opinion.

GENUS II.

ANETUS.

INTERMITTENT FEVER. AGUE.

PAROXYSM INTERMITTING, AND RETURNING BEING THE COURSE OF THE DISEASE; THE INTERMISSIONS GENERALLY PERFECT AND REGULAR.

Under the preceding genus, the remote cause, whatever it consists in, lays a foundation for not more than one paroxysm. In the genus before us, the cause introduces a tendency to a recurrence of the paroxysm from the first; and, in most cases, with an interval that continues true to itself as long as the disease lasts. I say in most cases, because we shall see presently that, when intermittent fever has raged very extensively, it has not unfrequently established a type of one kind in one person, and of another kind in another; while, in the same patient, quotidians have changed to tertians, tertians to quartans, quartans to quotidians, and all of them in a few instances to continued fever, in the most capricious and anomalous manner.*

Dr. Cullen unites intermittents and remittents into one section of fevers, merely distinguishing them as intermittents with an interposed apyrexy, and intermittents with remission alone; and, as already observed, he makes it a part of the pathognomonic character of both that they are derived from marsh miasm—*miasmate paludum ortæ*—as though there were no other cause of their production, whence Dr. Young gives to intermittents and remittents the common name of *paludal* fever.

The only ground, then, assumed for this union of intermittents and remittents, is the supposition, that the cause which generates them is

* "In hot climates, and even here, many intermittent fevers become remittent, and from being remittent, they will become continued, unless vigorous measures are adopted, and they may rapidly prove fatal by congestion of the head, thorax, or abdomen. Now and then this may be the case here, from some peculiarity in an epidemic. We have no idea in this country of what aguish fevers, intermittent or remittent, are in hot climates. In Italy these are called pernicious fevers; for, as soon as a person is seized, he may fall into a comatose state, from which he never recovers; and, on inspection after death, the greatest degree of congestion is found in the lungs and head, and also in the abdominal viscera."—Professor Elliotson's Lectures at Lond. Univ., Med. Gaz., 1831-2, p. 926

single, common to the two, and never generates any other fever. Now, although the febrile miasm, issuing from marsh lands, is by far the most common cause of intermittents, it is by no means the only cause; for we find intermittents, like all other species of fever, produced from various sources; existing in hot countries as well as in cold, in high lands as well as in low lands, sporadically as well as epidemically; sometimes excited by sympathy, sometimes by contagion. Even in tertians, Dr. Cullen is obliged to admit of instances in which other agents are necessary; but then, says he, they are only *co-agents*, and would not operate alone. "*Has potestates excitantes pro parte principii hic admittimus licet neutiquam excitassent*, si miasma paludum non antea applicatum fuisset." But this is the very point of controversy; for, in many instances, they produce the disease where marsh miasm cannot be suspected. I have seen an isolated case of a regular tertian on the highest part of Islington; and another on the dry and gravelly coast of Gosport, a situation so healthy that all the inhabitants escaped, when, in the year 1765, a most fatal and epidemic fever, originating unquestionably from the miasm of swampy grounds, pervaded the whole Island of Portsea, situate at not more than a mile distant on the other side of the water, and exhibiting, in different individuals, and often in the same person, all the diversities of the intermittent, remittent, and continued type. Dr. Fordyce affirms, that he has seen an intermittent communicated by infection, meaning the miasm from human effluvium;* and where the yellow fever has long existed, or become widely diffusive, this is common. Where it arises from sympathy, or organic affection, the case is still clearer. "Two children," says Mr. J. Hunter, "had an ague from worms, which was not in the least relieved by the bark; but by destroying the worms they were cured. We have in like manner agues from many diseases of particular parts, more especially of the liver and the spleen, and from an induration of the mesenteric glands."*

But one of the most singular and convincing proofs, that the decomposition of marsh lands is not essential to the production of intermittent fever, is to be found in the epidemic intermittent of 1780, as described by Sir George Baker, and which we shall have occasion to advert to more particularly hereafter; for, du-

* Dr. Cleghorn, in his work upon the diseases of Minorca, expresses a similar belief. "Dr. Wells, a colleague of Dr. Fordyce at St. Thomas's Hospital, accounts for Dr. Fordyce's opinions by remarking, that he (Dr. F.) fancied that continued and intermittent fevers were mere varieties of the same disease; and, as it appeared in those days, that continued fever was contagious, so he was obliged to maintain that ague was contagious. Dr. Cleghorn's mistake is supposed to have arisen from his having observed, that most of those who were about the sick in Minorca had the disease, forgetting that it did not arise in consequence o emanations from the sick, but from the situation in which they were placed."—(Elliotson's Lectures at the Lond. Univ., Med. Gaz., 1831-2, p. 921.) This want of discrimination is evident in much of the argument brought forward by writers in proof of the extension of certain diseases by contagion. In opposition to Dr. Fordyce's hypothesis, let us hear what conclusion Dr. Brachet, physician to the Hôtel Dieu of Lyons, has adopted, as the result of his investigations:—"I have seen," he remarks, "tanyards situated in the midst of intermittent infection; and to my inquiries the reply has been, that the disease leaves these places untouched. I attended for a long while the anatomical theatres and hospitals, yet never found my fellow-students suffer from intermittent fevers. I have seen the horrors of war bring typhus among us, but not intermittent fever. I have consulted authors: everywhere have I seen typhus arise from the infection of animal miasmata, and never are intermittent fevers the consequence of the crowding of human beings or patients together, or from the action of the putrid emanations of animal substances." He then notices that butchers, leather-dressers, fellmongers, and others, whose business exposes them continually to the effluvia of putrid animal substances, do not suffer from intermittent fever. Dr. Brachet then shows how you may at option render the most healthy village the seat of intermittent fever, by forming pools about it, in very hot weather, for the watering of hemp, and then removing them. This he regards as a convincing proof, that intermittent fevers are the product only of emanations from putrefying vegetable substances. He observes, likewise, that intermittent fevers never prevail to any extent in winter, but at the commencement of the warm weather of the spring, or in the autumn. The reason of this is, that the cold of winter prevents vegetable matter from putrefying, while the warmth of spring promotes the decomposition of it. The active vegetation which then follows, furnishes no detritus till the end of summer, when intermittents begin again; a little earlier or later, in different years, according as vegetation may be more or less advanced, and the period when its detritus is blended with stagnant waters.—(See Archives Gén. de Méd., tom. ix., p. 380.)—ED.

* On Blood, part ii., chap. iv., p. 411. Here, perhaps, it would be more correct to say, occasionally, but without any regularity, from local irritation. Thus, when matter forms in deep-seated parts, there is frequently one or more rigours, followed by heat, &c.; and when patients have strictures, for which they are using bougies, the same kind of constitutional disturbance is not uncommon; but it has not the regular type of intermittent fever; and, even if it had, the case would throw no light on the question, whether common ague can be excited by effluvia from animal substances? Dr. Elliotson admits, in his Lectures, that sporadic cases, even of ague, which cannot easily be traced to malaria, are frequently met with; but he has no doubt, that, if we could ascertain all the circumstances, we should find, that the individual had a striking tendency to it, and had been exposed to malaria by passing through a market, or some other place, in which there was vegetable matter in a state of decay. The same excellent physician also reminds us, that, though the influence of malaria is so great, yet, cold and wet, and other causes of debility, will induce ague without the reapplication of malaria, when a person has once had it. Sometimes, too, when malaria has been applied, the disease does not occur till such circumstances as these have taken place. These observations are of great value in accounting for circumstances in the history of ague, which would otherwise lead to most erroneous views.—ED.

ring this, the intermittent harassed very extensively the elevated parts of Lincolnshire, while the inhabitants of the neighbouring fens were free from its ravages.—(*Med. Trans.*, vol. iii., art. xiii.) And, in like manner, the dry and healthy climate of Minorca is sometimes attacked with remittent or intermittent fever, while Sardinia, proverbial for its insalubrity and febrile epidemics, escapes.—(*Cleghorn, Disease of Minorca.*) "In the year 1812," says Dr. Macmichael, "I was detained several months at Trichiri, a small seaport in the mouth of the Gulf of Volo, in Thessaly. The town is built on a dry limestone rock, but it is notorious for *malaria*. During my stay here, I made an excursion to visit the celebrated pass of Thermopylæ, and slept one night near the marshy district in that neighbourhood. On my return, the friends whom I had been waiting for arrived from Athens, and we all embarked on board a Greek vessel, to cruise in the Archipelago. On the following day I was seized with a most severe fit of the ague, and, at the same time, a servant belonging to the party suffered a similar attack. It might be said that I had caught my intermittent at Thermopylæ, but the servant had not quitted the dry rock of Trichiri, upon which he had remained more than a week."—(*New View of the Infection of Scarlet Fever*, &c., 8vo., 1822.) In like manner, Sir Gilbert Blane informs us, that while the village of Green Hithe, nearly on a level with the marsh of Northfleet, is unaffected with intermittent fevers, the adjacent hills suffer considerably from them: and he refers to other anomalies of the same kind.*

To unite remittents, therefore, with intermittents, from an idea of their having a single and common origin, is to depart from the clear line of symptoms into a doubtful region of etiology. If intermittent ought to be separated (as unquestionably they ought) from continued fevers, so ought remittent to be separated from intermittent. To say that intermittents often run into remittents is to say nothing, for remittents as often run into continued fevers; and it is now an established doctrine, that there is no continued fever whatever without occasional remissions. In effect, all fevers have a tendency to run into each other, and many causes are perhaps common to the whole. The difficulty is in drawing the line; yet a like difficulty is perpetually occurring to the physiologist in every part of nature; and equally calls for discrimination in zoology, botany, and mineralogy; and Dr. Parr has correctly observed, that "if a *specific* distinction can be established in any branch of natural history, it must be in the separation of remittents from intermittents." Vogel unites remittent with continued fevers, to which Cullen, rightly enough, objects; but the former has as much reason on his side, as the latter has for uniting them with intermittent. Sauvages, Linnéus, Sagar, and most modern writers, correctly distinguish each from the other. It must nevertheless be admitted, that marsh miasm is by far the most frequent cause of intermittents; and hence the frequency and severity with which they visited our own country in the sixteenth and seventeenth centuries, before the lowlands were artificially drained of their moisture, and, consequently, the atmosphere of its taint; during the former part of which, Dr. Caius tells us, that the mortality from agues in London was such, that the living could hardly bury the dead; and Bishop Burnet, that at one time, 1558, they raged like the plague.

When an intermitting fever or ague is, by the operation of marsh miasm, or any other cause, once introduced into the system, and has once discovered its type, or given an interval of a particular measure between the close of the first and the commencement of the second paroxysm, it continues true, as a general rule, not

* Select Dissertations, &c., p. 111. Such anomalies may perhaps be explained on principles which leave the Cullenian doctrine as firm as ever. "A certain degree of moisture," as Professor Elliotson observes, "is necessary for the production of ague by the fermentation and putrefaction of vegetable matter, which gives rise to the exhalations. Hence, in a moderate swamp, you see why dry weather may put a stop to the disease, namely, by putting a stop to putrefaction; and you also see why, in extremely wet situations, there is often no ague, because too much fluid impedes putrefaction; but this wet, by dry weather, may be reduced to just sufficient swampiness for vegetable decomposition to take place, and malaria to be produced. Just as dryness would prevent decomposition, so extreme wetness and moisture will likewise stop it. If the matter which is to be decomposed be diffused in a very large quantity of water, the putrefaction of course ceases, or is not evident; so that some places which were very wet and healthy, have been made unhealthy by being dried just sufficiently for putrefaction to go on vigorously; and again, other parts, which were dry, and which never gave out any exhalations, have been caused to do so by a certain degree of moisture falling upon them. Thus, you see, that according to situation, the same additional moisture may produce an ill or a salutary effect. High grounds may, therefore, suffer from the same cause, which removes all unhealthiness from low grounds A certain degree of rain, falling upon high ground will not all remain there, but will roll down; still, it has moistened the parts sufficiently for decomposition to take place above; whereas, when it comes on the low grounds, and there collects, it may be so abundant as to dilute all the vegetable matter, and prevent it from putrefying, and so put a stop to the unhealthiness of the part."—(Lect. at Lond. Univ., Med. Gaz., 1831-2. p. 845.) Considerations of this kind throw light on various circumstances, which would otherwise be completely perplexing, or lead to erroneous inferences. Even supposing no rain at all had fallen on high lands, where ague prevailed, while none existed in lower situations, we are to remember, that the nocturnal dews in many places are nearly equivalent to rain. The fact that malaria is more likely to produce ague when a person has been exposed to it at night, or in a state of health impaired by fatigue, privations, and other causes, is generally acknowledged. Strangers, also, who visit situations where malaria is present, are more frequently attacked with intermittent or remittent fevers than the natives themselves.—Ed.

merely to the same measure or extent of interval, but to the length and severity of paroxysm, through the whole course of the disease; the character of the cold stage determining that of the hot, and both together that of the sweating stage; and the paroxysm ceasing because it has completed its career. But the first interval, like the first paroxysm, which regulates the rest, is of different duration in different cases: of the reason of this difference we know nothing; sometimes it seems to depend upon the season or the temperament of the atmosphere, operating upon the febrile miasm that is diffused through it, and all who have agues in the same place, or at the same time, have them of the same kind.* Sometimes, on the contrary, it seems chiefly to depend upon the time of life, the idiosyncrasy, or the particular condition of the constitution, for, as already observed, different individuals, even in the same place and under the same roof, exhibit different types. But upon this subject we have no clear information. It seems expedient, however, to observe, that the fact itself of such regularity of recurrence and interval is an insurmountable objection to the doctrine of M. Broussais, that all fevers consist in an inflammation of the mucous membrane of the stomach or intestines, as in truth it is to every hypothesis that contemplates fever as a local inflammation of any organ. And hence the doctrine of types is an intractable stumbling-block to all such writers; who, from the difficulty of encountering them, are too apt to ejaculate with M. Monfalcon, "peu importe le type d'une pyrexie" (*Histoire des Marais et des Maladies causées par les Emanations des Eaux Stagnantes*, 8vo., Paris, 1824); and then dexterously to reach forward to some point of much easier solution.—(From "*It seems*," &c., an addition from the author's MS.)

Nevertheless, whatever be the cause of these discrepances, it lays a good foundation for dividing the intermittent genus into distinct species, and the five following are sufficient to comprise all its principal diversities:—

1. Anetus Quotidianus. Quotidian Ague.
2. ——— Tertianus. Tertian Ague.
3. ——— Quartanus. Quartan Ague.
4. ——— Erraticus. Irregular Ague.
5. ——— Complicatus. Complicated Ague.

As the connexion between all these is peculiarly close, and they occasionally run into each other's province; and, more particularly, as the same mode of treatment is common to the whole, it will be most convenient to defer the general history and praxis, till we have taken a survey of these species in their respective definitions, and the varieties they often exhibit.

It may, however, considerably assist the student, and simplify his pursuit in acquiring a knowledge of their characters, to attend to the three following remarks:—

Firstly, the shorter the intermission, the longer the paroxysm.

Secondly, the longer the paroxysm, the earlier it commences in the day.

Thirdly, the more durable the cold fit, the less durable the other stages.

Thus, the quotidian has a longer paroxysm and a shorter interval than the tertian; and the tertian a longer paroxysm and a shorter interval than the quartan. And thus again, while the quotidian has the longest duration, it has the slightest cold stage; and while the quartan has the shortest duration, it has the longest cold stage. It is also the most obstinate to cure.

Each of these species, however, admits of considerable variations: for sometimes we find the paroxysm protracted beyond its proper period; sometimes anticipating, and sometimes delaying its proper period of return. In other cases, we find each of these species catenated with, or giving rise to foreign symptoms or other diseases. And we also meet with a peculiar variety of the quotidian ague, in its being sometimes limited to a particular part or organ, in which case it is usually accompanied with very distressing pain.

The most irregular of all the species is the fourth, for this is sometimes found to deviate from all the three rules I have just laid down; but particularly in the greater length of its interval, which is sometimes double or even treble that of the quartan, whose interval of seventy-two hours is the longest of the three more disciplined species; it is hence found under the various forms of a five-day, a six-day, a seven, eight, nine, and even a ten-day ague; and sometimes is so extremely vague as to bear no proportion whatever between the violence of its paroxysm, the duration of its stages, and the period of its return.

The fifth species is distinguished from the rest by its peculiar complexity, consisting of double tertians, triple tertians, unequal tertians, duplicate tertians, together with as many varieties of the quartan type; the nature and key of which will be more particularly noticed under the species itself.

SPECIES I.

ANETUS QUOTIDIANUS.

QUOTIDIAN AGUE.

INTERMISSION ABOUT EVERY TWENTY-FOUR HOURS; PAROXYSM COMMENCING IN THE MORNING; USUAL DURATION UNDER EIGHTEEN HOURS.

THE genuine quotidian is of less frequent occurrence than the other species; but it has a considerable resemblance to that variety of the complicated intermittent, which has generally been denominated a double tertian, and with which it is often confounded. It is distinguish-

* Agues occurring in the spring, are generally tertians and quotidians, and readily give way to proper remedies; while those prevailing in the autumn are more intractable; and quartan intermittents (the most intractable of all) constitute then a more considerable proportion of the cases. Dr. Joseph Brown, in Cyclop. of Pract. Med., art. FEVER

"Febris autumnalis
Est longa aut lethalis."

able, however, to an attentive eye, by the regularity of its paroxysms, which are true to themselves on every return; while, in the double tertian, the alternate paroxysms only are true to each other, as we shall have occasion to observe more particularly in the proper place. The quotidian, like the tertian and quartan, has sometimes been epidemic.

The quotidian intermittent is occasionally limited in its attack to a particular part, and is occasionally connected with other affections. It deviates also now and then from its common rule, in having an imperfect intermission, and in precipitating or procrastinating every subsequent paroxysm; and hence affords us the following varieties:—

α Partialis.	Partial quotidian.
β Comitatus.	Catenating quotidian.
γ Protractus.	Protracted quotidian.
δ Anticipans.	Anticipating quotidian.
ε Cunctans.	Retarding quotidian.

In the PARTIAL QUOTIDIAN, the febrile attack is confined to a particular part or organ, and usually accompanied with distressing pain.

Under this modification, sometimes one side of the body has suffered, while the other has escaped; sometimes one or both eyes; but more generally the whole or half the head, not unfrequently resembling cases of cephalæa, and particularly that species of it which is called hemicrania.

In the CATENATING QUOTIDIAN, the disease associates with, or gives rise to, various foreign symptoms or other diseases; and hence is often found in union with rheumatic affections, particularly lumbago and sciatica. Sauvages quotes a case, in which it associated with daily attacks of a frightful epilepsy.—(Class ii., *Febr. Intermit.*, Quot. Spec. iv.) And Dr. A. Monro narrates a similar instance, though less severe, and alludes to several others.—(*Edin. Med. Essays*, vol. ii., art. xix.) Torti has made a collection of numerous examples of this variety, and has united them into one family, under the name of febres intermittentes comitatæ. Galen has described one or two of them under the name of epiala.

In the PROTRACTED QUOTIDIAN, the intermission is inordinately short or imperfect. In the former case, the paroxysm is lengthened beyond the usual period of eighteen hours; and, in the latter case, it does not so completely subside as to leave the intermission totally clear of febrile symptoms. On which last account the Latins describe this variety under the name of quotidiana continua; and the Greeks under that of amphemerina.

In the ANTICIPATING QUOTIDIAN, which is the name given to our FOURTH VARIETY from Dr. Fordyce, the paroxysm precedes its antecedent period usually by about two hours, and continues the same fore-march at every recurrence; so that the accession may hereby be thrown into any hour of the day or night. This form is denominated a *febris subintrans* by Professor Frank and various other writers.—(Op. cit., tom. i., p. 41.)

The RETARDING QUOTIDIAN, which, like the last, has been particularly noticed and named by Dr. Fordyce, forms a direct counterpart to the anticipating; the paroxysm delaying its antecedent period usually by about two hours, and continuing the same delay at every recurrence; so that here also the accession may be thrown into any hour of the day or night.

There are few diseases, moreover, in which the quotidian is not occasionally to be found as a symptom; but it occurs especially in hysteria, catarrh, gout, peripneumony, ischury, quinsy, and several species of odontia.

SPECIES II.

ANETUS TERTIANUS.

TERTIAN AGUE.

INTERMISSION ABOUT FORTY-EIGHT HOURS: PAROXYSM COMMENCING AT NOON; USUAL DURATION UNDER TWELVE HOURS.

THE tertian ague, the tritæus of the Greeks, occurs most frequently in the spring and summer months; though there is a spurious kind that shows itself in the autumn. The chill, during the cold fit, is intense, with convulsive shivering, rigidity, and gnashing of the teeth. It is, however, of shorter duration than that of the quartan, and sometimes passes off in less than half an hour; and is succeeded first by nausea or vomiting, and afterward by a pungent penetrating heat, frequent respiration, urgent desire for cold drink, wakefulness and headache, sometimes delirium. At length, a moisture on the skin, gradually advancing to a copious sweat, breaks forth, the urine commonly deposites a lateritious sediment, and there is often some looseness of the bowels. The entire paroxysm sometimes ceases in six hours, but more generally extends to eight or ten; if it exceed twelve, as it does occasionally in the autumn, the disease forms the spurious tertian I just have alluded to. As the quotidian is mostly common to infants and persons of delicate habits, the tertian chiefly affects those of riper years or of firmer fibres, and especially persons of a bilious temperament. It was the opinion of Hippocrates, that the tertian ague, if left to nature, would run itself out in seven paroxysms; and Vogel adds, that when this is the case, there is usually the appearance of a dry scabby eruption about the lips on the fourth or fifth paroxysm. But the period, pointed out by the former, does not hold in our own day; and the disease has often continued obstinate in spite of cutaneous eruptions, not only about the lips, but over the body. Sydenham asserts, that, in the autumn, in which, however, a genuine tertian is rarely to be met with, its ordinary natural course is double the term allotted by Hippocrates, or rather, that the term of its paroxysms amounts to the space of fourteen days. The tertian exhibits occasionally the two following varieties:—

α Comitatus.	Catenating tertian.
β Protractus.	Protracted tertian.

To both which the explanation already given

under the same terms in the preceding species will equally apply. As an associate disease, it is chiefly to be found united with syncopal and soporose affections, indicating some oppression of the brain; or with cholera or dysentery, mostly indicating irritation or congestion in the liver.

SPECIES III.

ANETUS QUARTANUS.

QUARTAN AGUE.

INTERMISSION ABOUT SEVENTY-TWO HOURS; PAROXYSM COMMENCING IN THE AFTERNOON; USUAL DURATION UNDER NINE HOURS.

THIS, which is also the quartana of Celsus, is the tetartæus of the Greek writers. It is rarely found in the vernal season, but is common in the autumnal, in which quarter, also, it is far the most obstinate of all the species, and especially if, as Celsus observes, it show itself only a short time before the commencement of winter. Its chief subjects and sufferers are those of advanced years, and of a melancholic habit; for children and young persons, who principally feel the effects of the two former species, are but little obnoxious to it. It commences usually about, or a little before five o'clock in the afternoon. The cold fit is less vehement than in the tertian, but of longer duration, and will sometimes continue for two hours, but usually without sickness or diarrhœa. It yields to a heat that is rather troublesome from its dryness than from its intensity, and which is rarely succeeded by a sensible perspiration. There is a heaviness or dulness in the head, rather than acute pain: and often, during the intermediate days, a sense of soreness over the body, as though it had been generally bruised, which strikes through to the bones. It is here also we principally meet with parabysmic tumours, and especially of the spleen and liver: in the former of which organs they are vulgarly called *ague-cakes*.

The quartan offers the following varieties:—

α Comitatus.	Catenating quartan.
β Protractus.	Protracted quartan.
γ Anticipans.	Anticipating quartan.
δ Cunctans.	Retarding quartan.

Of all which an explanation will be found, by turning to the same varieties under the first species.

From the tendency which this species has to affect the abdominal viscera, it is often met with as a symptom in diseases of the spleen, liver, and various adjoining organs. And hence it occasionally interchanges with dysentery, and particularly when the latter is a prevailing or epidemic disease. This remark will also apply to the preceding species, and under the one or the other form was often found exemplified in the fatal dysentery that ravaged a large part of Ireland in the year 1818 (*Cheyne, in Dublin Hospital Reports*, vol. iii.), and which still more frequently occurs in tropical climates.—(*Climate and Diseases of Tropical Countries*, &c., by C. Chisholm, M. D., p. 52, Lond., 1822.)

SPECIES IV.

ANETUS ERRATICUS

IRREGULAR AGUE.

INTERMISSION AND PAROXYSM POSSESSING LITTLE REGULARITY: THE FORMER MORE THAN SEVENTY-TWO HOURS.

WE have already perceived that there is occasionally some degree of irregularity in all the preceding species, least of all, however, in the quartan. And hence all the above might, in such instances, be named erratic. But the peculiar character of the present species is, that the duration of the intermission exceeds that of all of them; on which account it can never be confounded with any of the rest.

The chief varieties are the following, which, however, might be considerably enlarged, but it is unnecessary. They are principally taken from Sauvages and Vogel; and, for other authorities, the reader may turn to the volume of Nosology:—

α Quintanus.	Five-day ague.
β Sextanus.	Six-day ague.
γ Septanus.	Seven-day ague
δ Octanus.	Eight-day ague
ε Nonanus.	Nine-day ague
ζ Decimanus.	Ten-day ague.
η Vagus	Vague and irreducible

Several of the above have occasionally persevered with great obstinacy; in some instances, for upwards of two years without ceasing. The last variety is equally irregular as to the violence of its paroxysm, the duration of its stages, and the period of its return. Several of Sauvages's species of hemicrania may be properly referred to this place, and especially those which by some writers have been denominated INTERMITTENT LARVATÆ, or disguised intermittents.

SPECIES V.

ANETUS COMPLICATUS.

COMPLICATED AGUE.

PAROXYSMS INTRICATE, MULTIPLICATE, OR BOTH.

THERE are numerous examples of ague, which, to an inattentive eye, are as irreducible to any regular order as those which belong to the last variety of the preceding species, but which, when minutely examined, are found, however intricate, to be composed of types, not that uniformly resemble each other, but that recur in alternate sets, every set being true to itself, while it differs from that with which it alternates in the duration of its intervals, or of its paroxysms, or of the time of its accession. And hence, although in some shape or other, most of them return perhaps every day, and are often mistaken for irregular quotidians, they are, in fact, double or triple tertians or quartans, discovering their real nature by these alternating distinctions:—

The following are the chief varieties:—

α Tertianus duplex. Double tertian.	The paroxysms of the one tertian occurring in the intermissions

	of the other; and the two sets evincing a difference of duration or of violence.
β Tertianus triplex. Triple tertian.	A double tertian, taking place as above; but one of the sets having regularly two paroxysms on the day of its return, and the other one alone.
γ Tertianus impar. Double unequal tertian.	The one set evincing a more perfect, the other a less perfect intermission.
δ Tertianus duplicatus. Duplicate tertian.	A single tertian with two paroxysms on the regular day of attack, the intervals being of ordinary duration.
ε Quartanus duplex. Double quartan.	The paroxysms of the one set occurring in the intermissions of the other, and evincing a difference of duration or of violence: with an interval on the third day alone.
ζ Quartanus triplex. Triple quartan.	Consisting of a single quartan with regularly-returning paroxysms; while each of the intervening days is marked with a slighter or separate attack.
η Quartanus duplicatus. Duplicate quartan.	Consisting of a single quartan with two paroxysms on the regular day of attack: the intervals being of ordinary duration.
ϑ Quartanus triplicatus. Triplicate quartan.	Consisting of a single quartan with three paroxysms on the regular day of attack: the intervals being undisturbed, and of ordinary duration.

Having thus distinctly noticed the several species and chief varieties of intermittent fever, I shall proceed to offer a few remarks upon its general history and medical treatment.

Whenever the accession of an intermittent is violent, be its type what it may, it is sometimes attended with very alarming symptoms, as syncope, apoplexy, vehement spasms over the whole system, or a coldness or torpor which threatens death.* Yet, when not violent, nor of very long duration, especially when of the tertian type, it is often serviceable to the general health, and carries off many disorders of other kinds Dr. Fordyce affirms (*On Fever*, Diss. ii., p. 16), that he has seen it of considerable use in curing or alleviating chronic rheumatism, habitual indigestion, cutaneous eruptions, protracted inflammations, epilepsies, and hysteria. And his assertion is corroborated by other authorities.—(*Salmuth*, cent. ii., obs. 14; *Ephem. Nat. Cur.*, dec. iii., ann. iii., obs. 30.) It is to this kind of remedial fever that Professor Frank gives the name of *depuratory*.—(Op. cit., tom. i., p. 48.)

The duration of intermittents is of great uncertainty. The vernal agues generally disappear with the advance of summer; the autumnal are more obstinate, and especially the quartan. Where they have remained long, and have become habitual, even their removal must be attempted with great caution; for, when abruptly suppressed, they have been known to lay a foundation for a host of other maladies, often of a more fatal description, as paralysis, various visceral affections, and even sphacelus.

Ludolf gives an instance of an eight-day ague (anetus *erraticus octanus*) continuing for eighteen years; yet this was probably a double quartan; while we have abundant examples of a continuance of the regular quartan for nine (*Eph. Nat. Cur.*, dec. ii., ann. viii., obs. 45), twelve (*Avicenna*, canonum i., lib. iv., tr. ii., cap. vi.), eighteen (*Madai, Von Weekselfiebern*, sect. 144), twenty (*Eph. Nat. Cur.*, dec. iii., ann. ix. and x., obs. 51), twenty-four (*Marcellus Donatus*, lib. iii., cap. xiv., p. 291; *Pontanus, De Febr. Conel.*, lib. viii.), and thirty years (*Binninger*, obs. cent. v., N. 64; *Wierus*, obs., p. 37), and one instance of its lasting for not less than forty-eight years.—(*Gabelchover*, cent. vi., obs. 74.) It is in this species, therefore, that we chiefly meet with those congestions in the spleen which are called ague-cakes, as also with scirrhosities in the liver, pancreas, and other abdominal organs, which by Bonet, Swalwe, Senac, and other writers, have been regarded as causes of the disease, but by Van Hoven, and most pathologists of the present day, excepting, perhaps, Cruveilhier, are more correctly resolved into effects.

Schenck gives a case of congenital quartan, or in which it appeared in an infant immediately after birth (*Obs.*, lib. vi., N. 36); and Paulini another, in which though not strictly congenital, it appeared in very early infancy.—(Cent. i., obs. 94.) But such examples are rare. Among other singularities, I may observe, that the accession has sometimes been so violent as to destroy the patient in the course of the first paroxysm, of which an instance will be found in Senac (*Von Weekselfiebern*, b. ii., cap. vi.), while, at other times, it has been so slight and rapid, that the entire paroxysm has run through

* It once occurred to Dr. Joseph Brown to see a person die in what appeared to be the cold stage of a first fit of ague. Heat applied in various modes, ammonia, ardent spirits, ether, and other stimulants, failed to bring on reaction. The patient lay as cold as marble, and shivering violently, without any pulse at the wrist, and his heart acting very feebly, for eighteen hours, at the end of which he expired, his intellect having been unclouded till within a few minutes of his dissolution. The principal morbid appearance discovered was in the liver, which was very much enlarged, had a lobulated appearance, and was gorged with blood.—Cyclop. of Pract. Med., art. Fever.—Ed.

its course in a minute.—(*Reil, Memorab. Clin.*, vol. ii., Fasc.)

The character of the intermittent seems in a considerable degree to depend upon the age or idiosyncrasy of the individual, and the temperament of the atmosphere. We find, also, that variations more usually take place in the quotidian than in any other type, which we should, perhaps, ascribe to its occurring more frequently in early life, when the frame is more irritable; and to the debility which the constitution suffers from this type, above that of any other, in consequence of the greater length of its paroxysms, and the greater brevity of its intervals, by which means the prostrated strength of the system has no time to rally.

In this metropolis, from causes which have not been handed down to us, and which, indeed, do not appear to have been traced at the time, intermittent fevers were more than ordinarily frequent from the year 1781 to 1785: and the remarks I have just made apply in an especial manner to all these. As a single example, let us select those of 1782, as described by Sir George Baker and Dr. Reynolds, in an article drawn up by the former, with an admirable combination of learning and liberality, sound critical judgment, and inquisitive research.

"The type of the fever of 1781–2," says Sir George, "was either tertian or quotidian; the former being more common in the first part of the winter; the latter, from the middle of February to the end of June. With respect to the former, NOTHING OCCURRED to my observation which is worthy of notice"—(*Med. Trans.*, vol. iii., art. xiii.) On the latter, Dr. Reynolds communicated to him the following information:—

The quotidian fevers were irregular in their invasion, and uncommon in their appearance; and no cases resembled each other, except in very few circumstances. The first attack generally commenced with a horror; but the subsequent paroxysms, though often beginning with a sense of cold, were chiefly without horror. The intermission was short, and seldom perfect. The symptoms were very severe, and in many cases dangerous, and leaned strikingly to a typhous form. Great and sudden oppression of the head, anxiety, depression of spirits, a dry, parched tongue, yet less covered with hardened mucus than might be expected; a pulse low, quick, and intermitting; bowels variable; urine dark-red and clear, without any sediment, constituted the ordinary signs. Many had a low muttering delirium; two or three a laborious respiration; a few spasms and twitchings of the tendons: aphthæ appeared occasionally: and one patient exhibited symptoms of violently acute rheumatism. The bark was universally successful; and, "I was as much pleased," says Dr. Reynolds, "with its present efficacy, as I was in the year 1781 mortified by its extraordinary want of power. Half the quantity of it which I used on that occasion was sufficient on this."

In other words, idiosyncrasy and atmospheric temperament were both peculiarly visible, and gave a peculiar character, in the one instance, to particular cases, and, in the other, to the general disease. In plethoric habits, the head was greatly oppressed with a tendency to delirium. In those of a nervous and irritable disposition, the intermittent was connected with spasms and twitchings of the tendons. And those disposed to rheumatism, had acute arthritic pains. The state of the atmosphere, and the general character of the season, Dr. Reynolds has forgotten to notice; but we see evidently, and indeed he himself allows, that they give a typhous impression to the epidemic; which, from the same, or from other causes, is also peculiarly distinguished by the easy victory it yielded to the use of the bark, as that of the preceding year was distinguished by its obstinate resistance to this medicine.

If we ascend a year higher, or to 1780–1, we shall meet with an equal diversity of symptoms. "These fevers" (intermittents), says Sir George Baker, "were in general no other than the common ague; but in the more inland countries of England, they were often attended with peculiarities extraordinary and alarming. For the cold fit was accompanied by spasm and stiffness of the whole body; the jaws being fixed, the eyes staring, and the pulse very small and weak. In many cases, delirium was added to spasm, under both which symptoms the patient laboured quite to the end of the paroxysm. And though the senses returned when the fever subsided, yet a convulsive twitching of the extremities continued, even in the intermissions, to such a degree, that it was not possible to distinguish the motion of the artery at the wrist.

"This fever had every kind of variety: and, whether at its first accession it were a quotidian, a tertian, or a quartan, it was very apt to change from one type to another. Sometimes it returned two days successively, and missed the third, and sometimes it became continual. I am not informed that any died of this fever while it intermitted. It is certain, however, that many country people, whose illness had, at its beginning, put on the appearance of intermission, becoming delirious, sunk under it in four or five days. It is a remarkable fact, and very well attested, that in many places, WHILE THE INHABITANTS OF THE HIGH GROUNDS WERE HARASSED BY THIS FEVER IN ITS WORST FORM, THOSE OF THE SUBJACENT VALLEYS WERE NOT AFFECTED BY IT. The people of Boston and of the neighbouring villages, in the midst of the Fens, were in general healthy, at a time when this fever was epidemic in the more elevated situations of Lincolnshire: and other examples of a like kind have already been noticed.* It is

* Sir Gilbert Blane, Select Dissertations, p. 111, 8vo., Lond., 1822. In order to form a correct judgment of this part of the subject, we should have been informed of the state of the weather, not merely in respect to temperature, but quantity of rain that fell in the different places alluded to. The occurrence of ague sometimes in high situations, while it ceases in lower ones, will admit of explanation on principles already noticed in a preceding note.—ED.

likewise singular, and worthy of notice, that, in many families, the female servants were nearly exempted from a disease which very few male servants, especially the labourers in the open air, escaped. But the distinguishing character of this fever was its obstinate resistance to the Peruvian bark; nor, indeed, was the prevalence of the disease more observable, than the inefficacy of the remedy. Though the quantities of the bark usually given were exceeded, the fit was apt to return, rarely altered, either with respect to the time of invasion, or the intenseness of the symptoms; and just as if no means had been used to prevent it. A drachm of the bark in powder was frequently administered every second hour, without averting the fit."

In casting our eyes over the great diversity of medicines that have been employed for the cure of intermittents,* we shall find that, innumerable as they are, they may be arranged under two general heads, tonics and antispasmodics; as though, long before the time of Dr. Cullen, his two principles of the disease, debility and spasm, had been uniformly admitted and acted upon.

The antispasmodics, consisting chiefly of stimulants, sedatives, and relaxants, have been confined to the term of the paroxysm, with a view to weaken and shorten it; and the tonics, consisting principally of bitters and astringents, have been employed throughout the intervals, with a view of fortifying the system against a recurrence of the attack.

In discussing the medical treatment of intermittent fevers, it will be sufficient to limit ourselves to these two indications.

It was a favourite practice with Bergius to anticipate the cold fit, constituting the accession of the paroxysm, by pungent stimulants, in the hope that, if he could successfully combat this first stage, he should gain a complete victory, not only over the individual paroxysm, but over all future incursions. His favourite medicines for this purpose were garlic, mustard-seed, and capsicum. And he boasts of having, in numerous instances, completely succeeded, with each of these; though he admits that the mustard-seed answered best in vernal intermittents, but did not, in general, prove sufficient for the autumnal quartans. The Indian practitioners, I may here observe, employ chakka or ginger, and sometimes the sison ammi for the same purpose, and Dr. Chisholm has occasionally succeeded with scallions.—(*Clim. and Dis. of Trop. Coun.*, &c., 1822, p. 53.) Bergius, however, placed his chief reliance on the capsicum, six grains of which he was in the habit of giving, combined with two scruples of bay-berries in powder, "incipiente primo rigore;" and of repeating it every day, at the same hour, for three or four times in succession. And he assures us that he has very frequently seen obstinate intermittents removed by this powder, and without any relapse.

The practice, however, has not been equally successful in other hands; not even when capsicum has been given in a much larger quantity, or exchanged for ammonia, treacle-mustard (*clypoela jonthlapsi*), or black or white pepper, the latter of which is only the former denuded of its outward tunic, mixed up with brandy or Hollands. They have all, indeed, sometimes answered, but the result is uncertain; and, as was long ago observed by Van Swieten, if the medicine do not succeed upon a full dose, and especially when combined with ardent spirit, it will often extend its influence to the hot fit, and greatly exacerbate it; and not unfrequently convert an intermittent into a continued fever. Upon the whole, therefore, this plan is not to be recommended, however varied. The least pernicious material is the ammonia; but then it is also the least effective.

A large draught of cold water has been not unfrequently had recourse to for the same purpose, and also, in a few instances, with success. The object is, by taking it about half an hour before the cold fit is expected, to excite a strong reaction and powerful glow over the entire system against the time when the cold fit returns, and thus to preoccupy the ground; and, by disturbing the regularity of the type, to subdue the intermittent altogether. But this plan has, perhaps, more frequently failed than the preceding; and when the shivering or horripilation produced by the cold water has not been followed with a stimulant effect, as in delicate habits more especially, it has often continued so long as to run into the term of the febrile cold fit, and very considerably to increase its power. Ballonius relates a case in which it proved fatal.*

The next division of antispasmodics, which have been directed against the paroxysm, and especially against the rigour with which it makes its onset, is sedatives: and of these the chief have been opiates, which, when given in the form of laudanum, in a dose of from thirty to forty drops at the commencement of the chill, has, in many cases of intermittents, been highly beneficial; diminishing the duration of the stage, and moderating its symptoms. Dr. Trotter says, that he practised this plan with general advantage in an epidemic intermittent that attacked the Vengeance, one of the Channel fleet under Lord Howe; and adds, that, "if the first dose of opium did not produce a sensible relief

* Intermittents are sometimes cured merely by diet and regimen. Of twenty-three patients sent to the hospital la Charité, for the purpose of testing the efficacy of the misletoe (*Ilex aquifolium*), M. Chomel states that the disease ceased immediately in seven of them, although no medicine was administered.—See Mem. de l'Acad. Royale de Med., vol. iii.—D.

* Op., tom. i., p. 193. Venesection has been recommended as a means of shortening the cold stage, and of preventing the hot stage, or lessening its duration and violence. Dr. Mackintosh, in his work on the Practice of Physic, is in favour of such treatment. On the other hand, Dr. Stokes rather disapproves of venesection in the cold stage though he admits that it is beneficial in removing the symptoms of congestion about the chest and abdomen.—(Edinb. Med. and Surg. Journ., 1829.) Dr. Elliotson has never seen a case of ague which required venesection in the cold stage.—Lect. at Lond. Univ., Med. Gaz., 1832, p. 2.—Ed.

and exhilaration of spirits in half an hour, he repeated it, and never found it necessary to go beyond a second dose."* Sir Gilbert Blane adverts to the same plan, as pursued at Walcheren during the English expedition to that island, and with an equal success.†

We have already seen, however, that there is some cause or other, probably the peculiar temperament of the atmosphere at the time, that baffles on one occasion the remedy that has best succeeded on another. And hence opium has often failed in other intermittents in every form, but especially when given in the cold fit. And owing to this diversity of effect, Dr. Lind thought it most useful in the hot fit; and asserts that, if administered to the extent of twenty or five-and-twenty drops of laudanum half an hour after the beginning of the hot fit, it produced the advantage of shortening and moderating the heat, calmed the anxiety and headache, which are usual concomitants, expedited the sweating stage, made the paroxysms more regular, and sometimes stopped the fever altogether.

Other physicians have commenced with relaxants; and where these are selected, the antimonial preparations are to be preferred to ipecacuanha. They tend more directly towards the surface, and, where it is useful to excite vomiting, which is often the case, they act sooner, and maintain the action longer, and hence make a double effort to accelerate the sweating stage. The antimonial preparations differ chiefly from each other by having the reguline part of the antimony they contain in a more or less fusible state; and their operation will very often vary according to the quantity or quality of the acid they meet with in the stomach; and hence the different effect of the same preparation in different persons, and even in the same person at different times.

The most efficacious practice which I have witnessed, consists in uniting relaxants with opiates; and, where this joint effort is pursued, ipecacuanha may answer as well as any of the preparations of antimony. We cannot have, for this purpose, a more useful medicine than Dover's powder; and it should be commenced with much earlier than is consistent with the usual practice, so as not to regulate the hot and sweating stages, but to anticipate the cold fit. And we may still farther add to the ingredients of the medicine a full dose of ammonia with great advantage; for, it is in this form, if in any, that we can employ stimulants with a certainty of doing little mischief, and very nearly a certainty of considerable benefit. In the case of a quartan in St. Thomas's Hospital which had lasted two years, Dr. Fordyce determined upon this plan; and prescribed a full dose of Dover's powder, with a sweating draught of carbonate of ammonia, two hours before the paroxysm was expected. It succeeded perfectly. A profuse perspiration anticipated the period of the cold fit, and hereby entirely prevented it; bark was next given freely, and this obstinate ague was cured in a few days.—(*Edinb. Med. Comm.*, vol. vi., p. 359.)

Whatever be the relaxant or sudorific employed, it should be assisted by plentiful potations of warm diluents, and by placing the patient between the blankets instead of in the sheets of his bed: for, I have already had occasion to observe, that upon these auxiliary means depend, in many instances, the accomplishment of the object we have in view, without which the most urgent diaphoretic exerts itself to no purpose.*

The most important season, nevertheless, for medical operation, is in the intermission of the paroxysms: since, however successful we may be in moderating the febrile attack, it is rarely that we can depend upon any plan which may then be adopted, to prevent a recurrence of the fit.

The opinion of mankind seems to have concurred in most ages, in regarding debility as either the proximate or predisponent cause of intermittents, since almost the only medicines that have been brought forward to guard against the recurrence of their periodic attacks have been TONICS, with the sensible qualities of bitterness or astringency, or of both.

In what way these act upon the moving fibre at any time, and particularly in the diseases before us, we cannot say with any degree of precision. The tone of the moving fibre depends unquestionably in some degree upon the state of the fibrous material itself, but perhaps in a much greater degree upon the state of the nervous influence. We have great reason for believing, that astringents, in producing tone, act upon the fibrous material itself, for we find them operating in like manner upon animal fibres both in a living and a dead condition. But whether, as Dr. Cullen conjectures, it be the

* The administration of opium to arrest the invasion of intermittents, is one of long and extensive use in the United States. It is largely indebted for its popularity to the authority of Sir Gilbert Blane. Sixty or eighty drops of laudanum, blended with a few drops of sulphuric ether, or of aqua ammonia, are often administered a short time previous to the invasion of the cold chill. Many physicians will testify to the efficacy of this treatment, and few be disposed to question its efficacy, even in plethoric subjects. Plethora and local congestion however should always be considered, and bloodletting may sometimes be found an important preliminary measure. Dr. Gallup (*Epidemic Diseases of Vermont*) strongly condemns the use of opium in every form of intermittent fevers.—D.

† Select Dissertations, &c., p. 105, Lond., 8vo., 1822. Dr. Elliotson has given opium with very great success; yet, says he, "if I found great congestion of the head or other parts, I would order bleeding in preference to opium."

* Dr. Elliotson conceives, that in the cold stage, the plan of surrounding the patient with hot air would be better than putting him into the warm bath, as is sometimes done. Air in any quantity, and of any temperature, may be conveyed under the bedclothes by means of something like an inverted funnel, a tube, and a spirit-lamp. Dr. Elliotson has also a favourable opinion of the usefulness of friction. The warm drinks which are given, he thinks, should not contain wine or brandy, as such stimuli would be likely to increase the subsequent hot stage, bring on delirium, and cause congestion and inflammation of the head and internal organs.—ED.

part of bitters alone to act upon the nervous power or living principle, and especially in the very singular manner in which he represents them as acting, is a different question; and the present is not the place for entering upon it.

If we contemplate the brain and spinal marrow as the sources of nervous energy, we can readily conceive that the component parts of these organs, as well as of any other, may be invigorated by medicines that have a peculiar influence on their structure; and that consequently, such organs may be rendered capable of distributing the nervous power in greater abundance, or of producing it in a more elaborate perfection. And we can also readily conceive, that such effects may be produced by both bitters and astringents, as well as by medicines that possess some other sensible qualities, though these are the most obvious in their operation. But should we, with Dr. Cullen, affirm that the same bitter, employed in the same proportion, produces both tone and atony, energy and debility; that it both cures the gout and occasions it; that, employed for a certain time it effects the former, and, after such time, the latter; and should we beyond this affirm, with him also, that the nervous energy is not the production, but an inherent power, of the brain; that it admits neither of increase nor diminution; is changeable in its state, but unchangeable in its essence; becomes excited and collapsed, or rises and falls in its energy, but experiences nothing of the decomposition or recruit of every other part of the living frame around it; we should travel into a labyrinth of incongruities, and only enlighten ourselves with a will-o'-the-wisp. Dr. Cullen's system, like himself, is a work of no ordinary stamp; it is full of immortality, but mixed up with weak and perishable materials.

Of the remedies appertaining to the one or the other of the two divisions we are now considering, those of astringents and bitters, the cinchona, or Peruvian bark, which unites both qualities in itself, is on every account entitled to our first attention.

This valuable medicine, which some practitioners are apt to despise or think lightly of in the present day, has never been altogether without its opponents; and there are many facts respecting its operation, which, if not altogether anomalous, are of very difficult solution.

Peruvian bark, according to the authority of Don Joseph Villerobel, a Spanish physician noticed by Badus, was first brought to Spain in the year 1632; but here, as in every other country, it had for a long series of years to encounter the prejudices of the medical profession; and consequently was very rarely made use of, and unquestionably would have sunk into oblivion but for the activity of the Spanish jesuits, who continued zealously to recommend it, and to import large quantities of it from their brethren in South America. Through these means, it was at last recommended by Pope Innocent X., in 1661, as a medicine perfectly innocuous and salutary; and a Schedula Romana, drawn up under the sanction of the physician to his holiness, pointed out, in express terms, the time and proportion in which the bark was to be taken. Unfortunately, the time stated was *frigore febrili incipiente*, "at the commencement of the cold fit:" and it being administered in this manner, with only temporary benefit, to the Archduke Leopold of Austria, a year or two afterward, it immediately fell into great discredit with a very large and learned part of the medical community of Europe; and a most acrimonious warfare was instantly waged in every quarter on the subject, in which the combatants on both sides seemed more desirous of victory than of truth.

In our own country, the bark began to become popular about 1655. In 1658, Mr. Underwood, an alderman of the city of London, died while using it, and was instantly reported to have fallen a sacrifice to its power; and so prejudicial was the effect of this rumour, that Cromwell, who was attacked with an ague in the same year, was suffered to languish and at length to die without an exhibition of the bark, his physicians being afraid to make a trial of it, in consequence of the fatal accidents that had so lately accompanied its use: in the words of Morton (*Pyretolog.*, p. 17), "nondum vires corticis in hoc veneno subigendo, salteni hic loci, comprobatæ erant."

In England, therefore, as well as on the continent, there was a great conflict of opinion. Dr. Prejean, who both preceded and succeeded Dr. Harvey as president of the College of Physicians, appears openly to have advocated its employment in 1658, according to facts adverted to by Sir George Baker in his admirable article on intermittent fevers (*Med. Trans.*, vol. iii., art. xiii.), from which these hints are chiefly drawn up. Dr. Brady, professor of physic at Cambridge, appears equally to have countenanced it; as does Dr. Willis, according to his own statement: while Dr. Morton professed himself inexperienced upon its virtues, and Dr. Sydenham was decidedly adverse to its use.

Sydenham, however, was a man of reason and liberality. His prejudices, and especially those derived from the hypothesis, that a fever is a fermentation in the blood, raised by nature to throw off some peccant matter at the surface, and which ought not therefore to be checked in its course, however wise it may be to moderate it in its violence, were all at arms against the use of the bark under any circumstances: and the mischievous effects to which he had been an eyewitness in some instances, and its total inertness in more, gave a sanction to suspicion, if it did not justify hostility. But he was determined to watch it for a still longer period, through all its variable effects, and to abide by the result when fairly cast up. He soon became sensible that it was, in most cases, a powerful engine; that in many instances, it was highly serviceable; and that, in those in which it failed, the miscarriage was rather to be ascribed to some error in handling it, than to a want of power in the drug itself.

Sydenham had sufficient ground for this last conclusion. The mode in which it was, at this

time, usually administered, was in doses of two drachms given twice in the twenty-four hours; and, as already observed, the time selected for the purpose was during the existence of the paroxysm. It is, moreover, highly probable, that it was sometimes considerably adulterated, from the difficulty of obtaining it in any considerable quantity.

In 1658, we learn from Sturmius, who warmly patronised its use, that pure bark was so scarce on the continent that twenty doses of the powper were sold at Brussels for sixty florins, for the purpose of being sent to Paris; and that this order so completely exhausted the apothecary's stock, that he himself was incapable of obtaining any even at that price. And hence, for the use of one patient, who was attacked with an obstinate intermittent fever in the month of February of the same year, he was obliged to wait till the June following before he could obtain a supply.—(*Febrif. Peruv. Vindiciarum Pars prior*, p. 84, Antwerp, 1659.) Nor was it less difficult to be procured at Brussels than in many other parts of Europe; for Bartholine, then residing at Copenhagan, having received as a great rarity a present of three doses, or six drachms, of the powder from some friends who had brought it from Italy, was induced to make a trial of it on a lady who had a quartan fever. Of this small portion, the first dose, or two drachms, was rejected from the patient's stomach; and, in order to prevent a repetition of this accident, and consequently the loss of his entire stock, the administrator macerated his two remaining doses in wine for forty hours, and gave the infusion *during two successive paroxysms*. The only effect was, that the fever was changed from a double to a single quartan. And here the experimenter was obliged to stop, as having no more materials to proceed with.—(*Thomæ Bartholini Hist. Anat. et Med.*, cent. v., hist. l., Hafniæ, 1661.) But, even in 1678, when the same pretext for sophisticating it no longer existed, Morton complains that the bark offered for sale was become so inert, corrupt, and adulterated, that it was necessary to increase the proportion from two drachms, to one, two, or even three ounces for a single dose. And, thus given by wholesale, we cannot wonder that still more mischief should result from its abundance than from its scarcity, whatever might be the purity or impurity of its quality.

To guard against all the evils that seemed to accompany its use, Sydenham proposed to himself the following regulations:—

First, To be peculiarly cautious in the quality of the bark he employed; and to allow of no intermixture, whether from fraud or a view of increasing its virtue.

Secondly, To administer the bark in the intervals, instead of in the paroxysms of a fever.

Thirdly, To give it after the rate of two scruples every four hours, instead of two drachms twice a day, after the Schedula Romana.

Under these regulations, the bark seems to have acquired all the success to which it has at any time pretended; and modern practice has added little to their value.

The most important of them is that which effected a change in the period of exhibiting the bark. But, whether the merit of first suggesting this improvement be due to Sydenham, or to some contemporary of his, we cannot at present very accurately determine. He is, indeed, the only person who openly lays a claim to it, and asserts that he was led to this alteration after deeply pondering the subject—diù multumque apud se agebat: yet Morton, who published his Pyretologia in 1692, only three years after the death of Sydenham, asserts, somewhat loosely indeed, that, during twenty or five-and-twenty years (Pa. 114, 132), he had been in the habit of giving this antidote, as he calls it, in every season of the year, and to persons of all ages and constitutions; that he had cured every species of intermittent with it quickly and radically, and had found it more expedient to give it in the intervals than in the fits. While Lister, who was contemporary with both Sydenham and Morton, and who treats neither of them with respect, directly accuses Sydenham, a few years after his death, of having copied his mode of giving the bark from the miserable mountebank Talbor, who was its inventor,—auctoresuo, misero illo, agyrtâ, Talbor.—(*Octo Exercitat iones Medicinales de Cort. Peruv. exhibendi tempore.*) Talbor, or Tabor, however, is scarcely open to the stigma of being a mountebank. He concealed, indeed, his preparation of the bark, but he had been regularly initiated into a knowledge of medicine by an apprenticeship to an apothecary at Cambridge; was the most successful, and, therefore, the most popular employer of the bark in his day; acquired a higher reputation in this line of practice than any other individual whatever; was appointed one of the physicians to Charles II., against all the influence of the college; was specially sent for to Paris to take the Dauphin under his care; succeeded in curing him, and afterward divulged his arcanum, for a stipulated sum, to Louis XIV., by which it was found to be an infusion of the powder of bark in port wine as a cordial.

The best form of administering it used to be considered its powder, "potissima virtus in toto jacet," says Professor Frank. But it is often found that the stomach will not bear it in this form; and hence, modern chymistry has been at work to provide various others, the best of which appear to be those which consist of its essential principle, now sufficiently ascertained to be a peculiar bitter alkali, separated from the woody fibre, and neutralized into a salt by means of sulphuric acid. The French chymists have put us into possession of two distinct salts of this kind—QUININE and CINCHONINE, of which the former is the more powerful, and both appear to have been employed with great success in the removal of intermittent fevers, in cases where the stomach has uniformly rejected both the gross powder and the decoction.—(*De Cur. Hom. Morb. Epit.*, tom. i., p. 64.) The dose of the first, for an adult, may vary from two to five grains and half a scruple, and still more has been given without ill effects: of the second, the dose may be from ten grains to half a drachm. The ordinary ill effects from an over-

dose are, nausea, headache, and vomiting.—(*Magendie Formulaire pour la Prép. et l'Em. de plus. Médic.*, p. 49, Paris, 1822.) [It is related by M. Andral that, in some cases of tertian ague, M. Lerminier gave between 16 and 17 grains of the sulphate the first day of the treatment. The fever was arrested, and no unpleasant symptom followed. In some other individuals, similarly affected, this medicine, in the dose of only a few grains, produced violent palpitations, oppression, globus hystericus, giddiness, and fugitive pains in the chest and abdomen. This he imputes to idiosyncrasy.—(*Clinique Médicale*, tom. i., p. 488.) But, as Dr. Elliotson observes, quantities that can disagree are not required: five grains of the sulphate, every six hours, is the largest dose that can be necessary, at least in this climate; for, from the reports of Professor Speranza, doses of 12, 24, and 30 grains are common in Italy; and, in one case, 108 grains were given as a dose, before the fever was arrested. The medium dose prescribed by Dr. Perrine, of Adams county, in America, is eight grains every hour.—(*Edinb. Med. Journ.*, No. xciv., p. 218.) Many cases of intermittent fever in England have been cured with three, two, or even one grain, every six hours.—(*Elliotson in Med. Chir. Trans.*, vol. xii., p. 56.) Every case of ague which the editor has met with in the prisons of the King's Bench and Fleet has yielded to doses of two grains. Dr. Elliotson has also tried the simple quinine, the tonic properties of which he considers as corresponding to those of the sulphate. It never disordered the stomach, though given in doses of ten grains every six hours. One fact, adverted to by the same physician, is important, namely, that the foregoing medicines cure cases of intermittent fever which resist bark, even when retained in the stomach and freely administered. In a later communication on this subject, Dr. Elliotson mentions having attended nearly 150 cases of ague, and treated all with the sulphate of quinine. Many were combined with so much inflammation in the abdomen, chest, or head, that venesection was necessary; some with dropsy, and others with chronic diseases of the lungs or liver; but, *every one was cured*. Having never found the sulphate of quinine augment inflammation, or interfere with antiphlogistic measures, he has always given it under all circumstances, and adopted with it any other measures required by the symptoms. Some cases, generally quartans, would not yield to less than five grains every four hours; but this quantity never failed, after being exhibited a week or ten days.* In London, he finds that the disease may be generally arrested *immediately* by the exhibition of ten grains at once, just before or after the paroxysm. Dr. Home, he remarks, found the bark much more successful after, than before the paroxysm; and this, also, is his own experience with quinine. He is convinced that the best practice is, first to give ten grains, as soon as the paroxysm is over. Excepting in quartans, this almost always prevents the paroxysm next expected, and, if repeated daily at the same hour, often cures the disease. But, he says, it is sometimes necessary, in addition to these ten grains after the fit, to give small doses every six or eight hours, so as to make the whole quantity in twenty-four hours amount to a scruple or half a drachm.—(*Elliotson in Medic. Chirurg. Transac.*, vol. xiii., p. 464.) From what has been said, it would appear that the quantity of quinine and cinchonine contained in any one kind of cinchona, is the test of the comparative virtue of the different species; that the absence of these alkalis in vegetables which have been proposed as substitutes for cinchona, shows their difference, and accounts for their inferior efficacy; while others, in which these alkalis are found, may supplant the cinchona. Thus, the experiments made by MM. Robiquet and Petroz prove the existence of an alkali analogous to quinine in the bark of *carapa*, which has been known in America to cure agues, though they had defied the power of cinchona.—(*Quarterly Journal of For. Med.*, vol. iv., p. 68.)

From the investigations of M. de Martin (*Rev. Méd.*, Septembre, 1827), it appears, that when the sulphate of quinine is finely pulverized, mixed with cerate, and then applied to a blistered surface, it is soon absorbed, and thus a cure of intermittents may be performed; a fact worth remembering in examples where the stomach is very irritable.*]

It ought to be known, that one of the best preparations for a successful use of the bark, is calomel in small doses, particularly in intermittent fevers. "I have known," says Dr. Baillie, "a good many cases in which bark alone would not cure an ague. In all of these cases, as far as I now recollect, when a grain of calomel was given every night for eight or ten

* In February, 1829, Dr. Elliotson had a patient labouring under quartan ague, which did not yield to less than 45 grains in the 24 hours. He thought this a very considerable quantity; but, on his return from the continent in the ensuing October, he found a patient in the hospital, who was taking, by direction of Dr. Roots, a scruple every eight hours, with ten minims of liquor arsenicalis. The case, which was a quartan ague, did not yield to such doses until they were given every four hours, and then the disorder immediately ceased.—(Lectures, &c., Med. Gaz. for 1832, p. 4.) No general rule can be laid down respecting the quantity of sulphate of quinine which may be required.—Ed.

* Many persons when taking bark experience nausea, or even vomiting and purging; "and, in all such cases, a few drops of tincture of opium will frequently enable the stomach and intestines to bear it. If it be only the stomach that is disturbed, an effervescing draught will answer the purpose, and so will prussic acid. In the case of children, bark may be given in the form of clysters, and some persons have been cured, it is said, by its external application, by having it tied in fine muslin or linen, on different parts of the body. I recollect hearing Sir Henry Halford say, that, when he was a child, he had ague, of which he was cured by wearing a jacket of bark. A double jacket was filled with powdered bark, and put next his skin."—Professor Elliotson's Lectures at the London University.—Ed.

nights, bark cured the ague in the course of a few days. This practice I learned from my friend Dr. David Pitcairn."*

But as, under whatever form, in whatever quantity, and at whatever time the bark is given, it is not found to be a specific, not only in every individual, but in every intermittent, we are again driven to a principle I have already ventured to lay down, that intermittents of all kinds are occasionally influenced in their character by idiosyncrasies, or the temperament of the atmosphere. And it is hence of considerable importance to know what other medicines have the strongest claim to attention, when, from accidental circumstances, the best fails of its common effect.

This, as we have already had occasion to observe, was the case in the singular intermittents that prevailed both in this metropolis and in the country in the year 1787, in which the bark seemed to have no energy whatever, notwithstanding that its genuineness was sufficiently tested and proved; in consequence of which the febrifuge powers of various other medicines were attentively studied and appreciated. In some instances other medicines were mixed with bark, and seemed to a certain extent to call forth its proper power; a mixture of bark and alum answered in some cases, but produced disappointment in others. "The crude sal ammoniac," says Dr. Petrie, who was physician to the hospital at Lincoln, "had not a more certain effect. Several women were cured in a hospital by what is called the Dutch remedy for an ague; which is compounded of the bark and cream of tartar, each two ounces, and sixty cloves powdered. A drachm and a half of this powder was taken every third hour. Yet this likewise frequently failed. We at last thought that we had fallen on a specific in the powder of bayleaves, plucked from the tree and dried in the shade. From one to two scruples of it were given in the beginning of the cold fit. This powder was very efficacious in preventing the fits in many cases, where the bark, in the largest quantity, had been unsuccessful. But almost all who used it had a relapse in the space of a fortnight, three weeks, or a month. One patient, just at the time the fit was expected, took sixty drops of thebaic tincture. On this he fell into a profound sleep, sweated profusely, and escaped the fever, not only then, but at two successive periods. Eight quartans in the hospital, and four in private practice, were entirely cured by one drachm of the theriaca andromachi, the same of the root of calamus aromaticus in powder, and fifteen grains of salt of tartar. This mixture was taken in warm ale or wine and water, an hour or two before the fit. Nevertheless I must confess, that I met with several cases where no medicine prevailed; and many patients, despairing of relief, left themselves to nature; some of whom went into a pulmonary consumption, jaundice, or dropsy. Many, whom I thought cured of quartans, lately relapsed. I have now on the hospital books four patients, ill of quartan fevers, who have received no benefit; and I have no hope left, but in a long course of deobstruent bitters, and tinctura sacra, aided by the approaching summer."—(*Med. Trans.*, vol. iii., p. 165.)

Morton's medicine, of one scruple of chamomile flowers, ten grains of salt of wormwood, and the same quantity of calx of antimony, given every sixth hour, is said to have subdued, in the metropolis, an obstinate tertian in two instances. And Dr. Heberden found, that two drachms of the powder of myrrh, taken just before the time of the expected fit, relieved a patient from an ague, which for a long time had resisted the power of the bark, though taken in very large quantities.

The red-bark was now also tried for the first time: it was proved to be of unquestionably superior virtue to that in common use; but even a moderate dose of it so often oppressed the stomach and excited nausea and vomiting, perhaps produced by its containing a larger proportion of resin, that, writing at this very period, Sir George Baker tells us, "I have for some time avoided the use of it." It contains, however, by far the largest proportion of quinine, and is now usually selected for this purpose.

In the east a variety of other astringent and bitter barks are also employed both by native and European practitioners, and apparently with considerable advantage; as that called, in honour of Van Swieten, *Swietenia febrifuga*, so warmly recommended by Dr. Roxburgh: that of the bead-tea (*Melia Azedarach*), and the Tellicherry bark. All these have been now tried in Europe, but with a far less success than in India.

Arsenic was also tried, in combination with opium. It is admitted that it often effected a cure; but was frequently productive of violent vomitings, colic, and dysentery. It seems, however, to have been given at this period in a somewhat rude and unscientific form. "Arsenic," says the distinguished writer whom I have just cited, "is mentioned in books as a febrifuge, but it is one of those substances of which we are not as yet so far masters, as to be able, by any art, to render it transferable from the list of poisons to our Materia Medica; and it cannot be deemed to be a proper remedy for an intermittent fever, while an intermittent fever is less formidable than arsenic." But to this substance we shall have to return presently.

The chief BITTERS and ASTRINGENTS that have been called into requisition, independently of those already noticed, are, gentian, cascarilla, willow-bark, nux vomica, and the leaves of the cherrybay, or *Prunus lauro-cerasus*; the chief ASTRINGENTS, tormentil, galls, and oak-bark; the bark of both species of the swietenia or mahogany-tree; avens or caryophyllata (the *Geum urbanum*, Linn.), the *Lycopus Europæus* of the same naturalist, called in Piedmont, where it is supposed to rival the bark, herb China, alum, and several of the metallic oxydes.

To all these a common remark may be applied, that, where they have been of real ser-

* Lect. and Observations on Medicine, by the late Matthew Baillie, M. D., 1825. Unpublished.

vice, it has generally, though not in every instance, seemed to arise from their uniting the two qualities of a bitter and an astringent, and that they have rarely answered where there has been only one of these qualities to depend upon. Thus tormentil, one of the most powerful vegetable astringents we possess, and gentian, one of our most powerful vegetable bitters, succeed so rarely alone, that no dependance is to be placed upon them; but when given in combination, they almost rival the virtue of cinchona, and have occasionally succeeded where the latter has failed. "Joined," says Dr. Cullen, "with galls or tormentil, in equal parts, and given in sufficient quantity, gentian has not failed in any intermittents of this country in which I have tried it."—(*Mat. Med.*, part ii., ch. ii., p. 72.)

There is, however, a principle, independently of bitterness and astringency, that seems absolutely necessary to enter into conjunction with these, in order to give full efficacy to any medicine employed as a febrifuge in intermittents; and a principle that has hitherto eluded all research; [unless it be analogous to that of quinine, a principle similar to which has been detected in other barks besides the Peruvian.] If the cure depended upon the intensity of a bitter and an astringent quality alone, galls, oak-bark, and mahogany-bark ought to succeed better, not only than a union of tormentil and gentian, or chamomile and alum, which have also been found very serviceable, but than cinchona itself; which every one knows they do not; although, when Peruvian bark cannot be obtained, they become desirable substitutes.

The nux vomica and Ignatius's bean (*Strychnos nux vomica*, and *Ignatia amara*, Linn.) combine, with an intense bitter, a most active narcotic virtue; and how far the last may be peculiarly opposed to a recurrence of that spasm on the extreme vessels which constitutes the cold fit, it is difficult to determine. M. Bourieu (*Hist. de la Soc. R. de Méd.*, 1776, p. 340) from his own practice strongly recommends the latter, and Paullini (Cent. iii., obs. 45), and Aaskow (*Ant. Societ. Med. Hafn.*, tom. ii.) the former. If Dr. Fouquier's remark be well founded, which we shall have occasion to notice more at large when treating of paralysis, that these poisons have a power of augmenting energy in debilitated muscular fibres, while they leave those in health unaffected, we can account for some part of the success which has been so vauntingly ascribed to them in the case of intermittents. But, notwithstanding that they have been for this purpose before the public for upwards of a century, the infrequency of their use is a strong argument that they are not much entitled to commendation. "In a very small dose," says Dr. Cullen (*Mat. Med.*, part ii., ch. ii., p. 76), "the faba Sancti Ignatii has the effect of curing intermittent fevers." But whether he reports this from his own practice, or from that of others, we cannot exactly determine: nor does he tell us what is the small dose he refers to I have tried the nux vomica to the extent of eight grains in powder every six hours for an adult under palsy, without any mischievous effect except a slight stupor in the head. And much beyond this we cannot proceed with prudence. Hoffmann (*Philos. Corp. Hum. Morb.*, p. ii., cap. viii.) gives the case of a girl of ten years of age, who was killed by taking fifteen grains of it, divided into two doses, for an obstinate quartan.

The lauro-cerasus was at one time, as we are told by Dr. Brown Langrish, a common medicine in his neighbourhood for the cure of agues (*Experiments on Brutes*; see also *Phil. Trans.*, No. 418, 420), but he takes no notice of the dose or mode of administering it. Its properties are nearly the same as those of bitter almonds; and Dr. Bergius frequently prescribed an emulsion of bitter almonds with success in intermittents, in the quantity of a pint or two daily during the intermission; and it sometimes cured where the bark failed.—(*Mat. Med.*, p. 412.) This is an authority worth attending to; and as the same medicines are said to have a peculiar power of resolving visceral obstructions, they have an additional claim to a cautious series of experiments. It is known in the present day, that their poisonous property depends upon their containing a portion of native prussic acid [and consequently the latter would now generally be prescribed by those who desire to ascertain its power over ague].

The only metallic oxyde really worthy of notice is that of arsenic; for although various oxydes of iron, mercury, zinc, and copper, have been tried, and occasionally extolled, none of them have proved so decidedly beneficial as to render it worth while to try them over again.

Mercury, as we learn from Sir James Johnson, was tried extensively some years ago at the Bocca Tigris in the east, on the crews of two ships-of-war, the Grampus and Caroline, in consequence of the stock of bark being exhausted. The paroxysms, he tells us, were invariably put a stop to as soon as the system was saturated; but he adds, that three fourths of the patients thus treated, relapsed as soon as the effects of the mercury had worn off; and this after three, and, in a few instances, four successive administrations, so as to excite ptyalism.—(*Amer. Med. Repository*, July, 1822.)

Iron, though of little value in most of its forms, has been said of late to have succeeded completely in that of its prussiate. Dr. Zollickoffer has given various instances of this in a foreign journal, and places its powers above those of arsenic or bark. It must be tried, however, upon a much larger scale before it is entitled to an established reputation. The ordinary adult dose is about four grains, two or three times a day, in a little sugar and water.

Arsenic, under various forms, has been employed from a very early period.—(*Act. Med. Berol.*, dec. i., tom. iii.) It is, strictly speaking, an oriental medicine, and has been in vogue immemorially in India, and indeed all over the east, but especially among the Tamul practitioners, as a most powerful alterant, as we shall have occasion to notice more at large when

treating of syphilis and elephantiasis. It was probably introduced into European practice by the medical students under the brilliant caliphate of Bagdad; and seems to have been first appropriated to the cure of intermittents by the Jewish physicians of Poland.—(*Gilbert, Adversar. Pract. Prim.*; *Slevogt, Pr. de Permissione Prohib. et Prohibitione Permiss.*, Jen., 1700.) In Sir George Baker's time, we have seen that it was in extensive use, but productive of such very different results, that, however successful it might prove occasionally, this distinguished pathologist thought it a worse evil than any ague whatever. At that period, however, it does not appear to have been tried in its most commodious forms, which are those of an arsenite or arseniate of potash. M. Macquer recommends the latter; Dr. Fowler, many years ago, introduced and gave abundant proof of the utility and general commodiousness of the former; and, under this modification, it has at length found its way into the Pharmacopœia of the London College, under the name of liquor arsenicalis. Sir Gilbert Blane tells us, that it was used with great success in our unfortunate expedition to Walcheren, where the stomach could not retain the bark: but was combined with opium, and, in most cases, with bitters and aromatics.—(*Select Dissertations*, &c., p. 105, Lond., 8vo., 1822.)

The cases of success from the use of this medicine are so numerous, and its employment is now become so general, as to render it unnecessary to advert to particular authorities in proof of its febrifuge power. With many constitutions there can be no question that it disagrees very considerably; and there are numerous instances of its failure: but it is a medicine of real and inappreciable value in many diseases, and in none more than in intermitting fevers. Dr. Fowler advises it to be taken in doses of from two to twelve drops, according to the age and strength of the patient, once, twice, or oftener, in the course of the day: and the directions are so broad, and at the same time so much within limit, that no actual harm can occur from following them literally. It will, nowever, often be found advantageous to combine a few drops of tincture of opium with each dose, to guard against the vomiting and griping which it is sometimes apt to excite; and the bowels should be kept open by warm aperients during its use. Under the French Directory a similar preparation of arsenic formed a part of the political constitution of the day; for an edict was formally published, commanding that the surgeons of the army of Italy should, within the course of two or three days, cure the vast number of soldiers suffering from agues caught in the marshes of Lombardy, by the use of this medicine, under pain of military punishment *

It is a singular fact, and ought not to be passed by without notice, that since the establishment of the large copper-works which are now carrying on in Cornwall, the intermitting fevers which used to be almost constantly present in the neighbouring marshes, are now rarely to be met with in any shape. It should hence seem, that the atmosphere is armed with a specific by becoming impregnated with metallic oxydes or carbonates; and that Cornwall should be the spot recommended for change of air in many cases of chronic or other obstinate intermittents.

The result of this general survey is, that the cinchona (including its preparations, quinine and sulphate of quinine) offers by far the best remedy for intermittents of every kind; that arsenic is its best substitute; and that, where these fail, as fail they will occasionally, or if particular circumstances should prohibit their use, we must throw ourselves upon such other medicines as unite intrinsically, or by combination, a bitter and an astringent principle with a certain proportion of aroma or stimulant warmth.*

It is at the same time clear, that a bitter and astringent principle are not the only, nor even the most effectual qualities, for the cure of an intermittent; for the arsenical preparations contain neither of these in any prominent degree; while, as already observed, there are many medicines that possess them in far greater abundance than the bark, which have no claim

* It is best to begin with two or three drops of the liquor arsenicalis, two or three times a day, and to increase the dose by degrees. As Dr. Elliotson suggests, this medicine should not be given on an empty stomach.—ED.

* Quinine is given so extensively by American practitioners, that little need be said to recommend it to more general use. When employed with prudence, it rarely produces any bad effects, not even in intermittents attended with local determination. It enjoys a supremacy over every article in the materia medica, and seems entirely free from the objections urged to bark. Dr. Eberle, however, remarks (Pract. of Med., vol. i.), "in cases of ague which from long continuance or from some previous malady, are attended with visceral indurations or enlargements, the quinine or bark must be given either after a gentle mercurial course, or in conjunction with mercurial remedies. The blue mass will in general answer best for this purpose, as it is mild, and less apt to pass off by the bowels than calomel." Arsenic must be considered as the most valuable of the minerals for the cure of intermittents. Dr. Mann observes (Medical Sketches), that it succeeded like a charm; and his remarks might be confirmed by quotations from many other medical writers of repute; but it sometimes leads to anasarcous effusions, and even paralysis has been remarked by Currie and others. —(Hosack and Francis' Med. and Phil. Register, vol. ii., p. 36.) According to Dr. Firth, the sulphate of zinc has cured intermittents when the bark and arsenic have failed.—(New-York Med. Rep., vol. x., p. 145.) And Eberle says of it, "I have very rarely failed to arrest the disease as promptly with it as with quinine."—(Pract. of Med., vol. i., p. 81.) The list of vegetable substances employed by American practitioners for the cure of intermittent fever is very great.—See Bigelow's Medical Botany, Barton's Collection towards a Materia Medica, Chapman's Therapeutics, Bigelow's Sequel, &c.

Among the remedies in popular use, the strong decoction of coffee deserves notice; the coffee in powder is highly recommended by some German practitioners.—D.

to be put in competition with it as a febrifuge. In effect, of the three species of cinchona used officinally in the present day, the lance-leaved, pale or quilled bark (c. *lancifolia*), heart-leaved or yellow bark (c. *cordifolia*), and oblong-leaved or red bark (c. *oblongifolia*), the yellow, which, as we learn from Mutis and Zea, is the genuine febrifuge of Spanish America, and whose superiority to the rest has been abundantly proved in this country as well as on the continent of Europe, is very considerably less bitter and astringent than the red, and not more so than the pale bark: it has less resin than the first, and less gum than the second. Dr. Cullen preferred the red, but Zea's communications upon the subject (*Annal. de Hist. Nat.*, tom. ii., Madrid, 1800) were not then published; and Cullen was not in possession of the experiments by which the statement of the latter has been confirmed. Sir George Baker, as already noticed, found the red bark produce so much oppression and nausea, that he was obliged to discontinue its use. It affords, however, the largest portion of quinine.

In administering the bark, little needs to be added to the rules laid down by Sydenham, and copied in a preceding page. Dr. Home has sufficiently shown, not only that the best time for commencing the medicine is soon after the paroxysm, but that it should be discontinued some time before a recurrence of the cold fit, since, if persevered in till its accession, this fit is almost uniformly rendered more violent.—(*Clinical Experiments*, 8vo., Edin., 1780.)

If in the proportion of half a drachm or two scruples to a dose, as recommended by Dr. Sydenham, or such other quantity as may sit without uneasiness on the stomach, it should not succeed, it should be tried in combination with some aromatic, or omitted altogether; and by no means be increased to the enormous quantities some practitioners have ventured upon, who seem to have conceived that they could force the system to yield to its powers, by the overbearing arms of weight and measure. It is singular that Borsieri should have so far lost sight of moderation, as to have prescribed occasionally from four to six drachms of the powder in a single draught. In the extremity of the yellow fever such doses have, indeed, been given, and perhaps with advantage; but opium and old port, in large abundance, have been given at the same time.

It will also be judicious to abstain from the use of bark in every instance in which any of the abdominal viscera appear to be labouring under parabysmic enlargements, whether antecedently to its employment or during its use; and, in these cases, to alternate small doses of calomel with whatever tonic may be found to agree best with the system. [Yet, as the editor has already stated, the experience of Dr. Elliotson proves, that the sulphate of quinine may be given beneficially, whether such enlargements be present or not: it has no power of preventing the cure of inflammation, nor does it interfere with antiphlogistic means.]

Among the endemic intermittents of the present day particularly worthy of notice, are those in the neighbourhood of Rome, and especially about the Pontine marshes, which have often been drained to carry off the decomposing animal and vegetable materials that spread their *aria cattiva*, as it is called, over the whole of the Campagna. The disease hence produced is named, from its source, *malaria*. It is also found in like situations, and has the same name, about Syracuse, and other parts of Sicily. M. Rigaud de l'Isle has asserted, that the miasmic particles which infect the air in these places, are heavier than the air in its loftier and lighter strata, and may be separated from it. He has found an elevation of 300 yards, at the Pontine marshes themselves, a complete security from infection; and he proposes for those who reside lower to sift the air which they breathe, by wearing a fine silk gauze over the mouth and nostrils.—(*Mém. de l'Institut. Royale de France*, March 24, 1817.) M. Brocchi has successfully employed the same remedy, and hence recommends sleeping under a fine moscheto-net in all places where intermittents are endemic.—(*Delle Stato fisico del Suolo di Roma*, &c., Di G. Brocchi.)

GENUS III.
EPANETUS.
REMITTENT FEVER.

SYMPTOMS STRIKINGLY EXACERBATING AND REMITTING, BUT WITHOUT INTERMISSION; ONE PAROXYSM EVERY TWENTY-FOUR HOURS.

This genus offers the three following species, which will be found sufficiently distinguished from each other by their specific characters:

1. Epanetus Mitis. Mild Remittent.
2. ——— Malignus. Malignant Remittent.
3. ——— Hectica. Hectic Fever.

In the last, the remission is perhaps more perfect than in either of the others: and it serves to show how little foundation there is for referring all remittent as well as all intermittent fevers to the individual cause of marsh miasm; for it would be difficult, though, perhaps, not impossible, to find a single example of a genuine hectic originating from this source.* Marsh

* The possibility of hectic fever arising from marsh miasm is a suspicion that may be dispensed with, as it is entirely destitute of foundation. There may be hectic fever in consequence of visceral disease, that has originated during an ague, and has not yet been cured; but as for malaria being ever itself the cause of hectic, the opinion is groundless. Perhaps, with the exception of remissions, hectic fever has no analogy whatsoever to what is commonly implied by remittent fever. As a judicious writer has observed, "remittent fever may be considered as holding a middle rank, as to external character, between intermittent and continued fevers; but, with respect to its nature, the localities in which it chiefly prevails, and the cause whence it principally, if not solely arises, it bears a closer affinity to the former than the latter. It may be regarded more properly as forming the mean degree

miasm, however, is the most common cause of the second, perhaps of the first species; though we shall presently find it probable that even here, and particularly in the second species, human contagion has also occasionally proved a cause, as it assuredly has in those cases of hectic fever, produced by perpetually attending upon, or sleeping with a consumptive patient.

SPECIES I.
EPANETUS MITIS.
MILD REMITTENT.

PULSE REGULAR, THOUGH FREQUENT; DEBILITY SLIGHT; REMISSION DISTINGUISHED BY SWEATING, OR A CLOUD IN THE URINE.

THIS species occurs most frequently among persons of relaxed fibres, debilitated habits, and sedentary occupations; and is usually preceded by an irregular action of the alvine canal, flatulence, abdominal tension, dyspepsy, or some other affection of the viscera of the lower belly; and is hence called by Professor Frank, as well in the ensuing as in the present species, *gastric fever* (*De Cur. Morb. Hom. Epit.*, tom. i., § 50, 99, 8vo., Mannh., 1792), intermittent, remittent, or continued, according to the type it assumes. It occurs at all seasons of the year, but more frequently in the autumn; the ordinary temperament of the season uniting with the patient's infirm state of health, and thus adding an exciting to a predisponent cause. Fatigue, cold, or long exposure to the rays of the sun, are also, at this time, powerful concomitants, and quicken the appearance of the disease.*

The patient complains of drowsiness, and feels languid; is occasionally chilly, and afterward flushed, but without perspiration; for the skin is hot and dry, the thirst considerable, commonly with nausea and a total loss of appetite. In the course of the day, but usually towards the evening, the pulse quickens, the heat increases, and at length terminates in a sweat, which, however, is sometimes only partial, rarely free and copious, and never critical; for, on its ceasing, the skin is still dry and heated, and the pulse accelerated. Sometimes the exacerbation occurs about noon, and sometimes in the middle of the night.

If the disease be left to itself, the symptoms augment in severity daily; the head occasionally, but more generally the liver, or some other abdominal viscus, gives proof of being loaded and oppressed, and the restlessness is intolerable; or a sudden cholera supervenes, and carries off the complaint by a salutary crisis.

This species seems to be primarily dependant upon torpitude, or obstruction in some one or more of the chylopoetic organs, and generally yields to a course of active purgatives, among which calomel ought to take the lead. These should be repeated two or three times a week, and the intervals be filled up with mild diaphoretics. The pulse will generally be found from ninety to a hundred strokes in a minute; but, as soon as it sinks below this, and the heat and dryness of the skin have yielded to a general softness, columbo alone, or combined with sulphuric acid, will easily complete the cure; though the disease not unfrequently runs on for ten days or a fortnight.*

THE REMITTENT FEVER OF INFANCY, which is generally ascribed to worms, does not essentially differ from the present, regard being had to the greater irritability in early life. Worms there can be no doubt, are sometimes the cause of this infantile fever, but perhaps rarely; and there is no instance on record of their having been traced in the bodies of those who have fallen victims to it. Dr. Hunter expressly declares, that he has often searched in vain. The ordinary cause is crude accumulations in the first passages, whence the digestion proceeds imperfectly; there is great general irritation, with considerable languor: the belly becomes tumid and often full of pain; the food is nau-

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in the scale of periodic or marsh fevers, of which intermittent and yellow fever constitute the extreme points. A more intense operation of the febrific cause than is required for the production of intermittent fever engenders remittent, and the more violent the latter, the more remote is its character from that of intermittent; or, in other words, the less perceptible the remissions. That a more powerful action of the morbific cause is demanded for the production of remittent fever, is indicated by the circumstance, that when periodic fevers are prevailing in certain countries, the permanent residents are often observed to have the disease in the form of ague only, and the mortality among them is small; but strangers unhabituated to the climate and its diseases, suffer from remittents, with a proportionably greater loss of life. In more sickly seasons, remittents will be the prevailing form among both classes of persons; but strangers are more violently affected, and the mortality among them is greater. Its affinity to intermittents is shown, too, by the tendency which it has to pass into that form, and inversely, by the proclivity of ague to assume the remitting type."—(Dr. Joseph Brown, in Cyclop. of Pract. Med., art. FEVER.) From such facts and reflections an argument might easily be deduced, which would shake very much the hypothesis of malaria, or marsh miasm, and the contagious principle of human effluvia, being capable of exciting similar fevers.—ED.

* Here no reference is made to the commonly received doctrine, that ordinary remittent fevers spring from the influence of marsh miasm, or malaria. Thus, as Dr. J. Brown has stated, remittent is the endemial fever of warm climates; but it is also met with in temperate regions, and in our own country, especially in seasons of unusual heat, and in those parts of it where, under ordinary temperatures, agues are prevalent.—Cyclop. of Pract. Med., art. FEVER.—ED.

* Prescribe six grains of calomel, which are to be followed by an active cathartic, and a mixture composed of four grains of tartarized antimony and eight ounces of camphire mixture, three tablespoonsful of which are to be given every fifth hour. As soon as the tongue becomes clean, the skin natural, and some impression is made on the disease, the fourth part of the following mild aperient mixture, given three times a day, will complete the cure:—℞. Magn. sulph. ʒvj, infus. gentianæ comp. ʒvj, acid. sulph. dil. ʒj; ft. mist. —ED.

seated: the head is hot, heavy, and often comatose; as though there were water in the ventricles, which is sometimes suspected, though without foundation: the skin is pale or livid, with occasional flushes in the cheeks. It is a singular fact, that, if the exacerbation or increase of fever take place in the night, there is wakefulness and perpetual jactitation; if in the daytime, drowsiness and stupor.*

Dr. Butter recommends as an aperient, small doses of neutral salts, and, when the bowels have been opened, nitrate of potash; or, if there be considerable irritation, the extract of hemlock. Generally speaking, however, there is such a sluggishness in the peristaltic action of the bowels, as well as in the intestinal secernents, that neutral salts will not answer the purpose; and, in consequence, rather add to the irritation than carry it off. And hence, much stronger purgatives should be employed from the first; as calomel, resin of jalap, or gamboge dissolved in milk; and it may be safely prognosticated, that, till this plan is had recourse to, the disease will in most instances maintain its ground, if it do not make a fearful advance.† But with a course of brisk cathartics, in conjunction with perfect quiet, good ventilation, and light nutritive food, it will usually give way in a week or fortnight.‡

* "By *infantile remittent fever* is now commonly understood a species of fever to which children from one year old, up to ten or twelve, are very subject, characterized by one or more daily exacerbations and remissions, by pain of the belly, and sometimes also of the head, and by an unnatural state of the alvine discharges."—Dr. Joy, Cyclop. of Pract. Med., art. Fever.

† In this insidious and often fatal form of disease, the first indication is to remove all causes of irritation, and to unlock the intestinal and cutaneous secretions. For this purpose, to the means mentioned above may be added the employment of small doses of ipecacuanha, alone or combined with rhubarb; say one or two grains of the former, with some three or four of the latter, administered once or twice a day for a few days, according to the exigencies of the case; the neutral salts will also be found useful. In a form of this complaint, the late Dr. Ed. Miller, of New-York (Medical Writings, N. York, 1824), recommended small doses of calomel combined with opium; this practice may often be useful where cerebral determination and vascular fulness are absent.—D.

‡ In France, infantile remittent fever is treated as a species of gastro-enteritis. That the secretions from the mucous surface of the alimentary canal are in a depraved state, is a fact generally admitted; but whether in consequence of inflammation, is a disputed point. Dr. Joy expresses his belief, that medicines which slightly increase and modify those secretions, will usually be attended with more success than the sole employment of directly antiphlogistic measures.—(Cyclop. of Pract. Med., art. Fever.) In very obstinate cases, Dr. Hamilton combined calomel with opium and antimony. On the other hand, Dr. Clarke, after the exhibition of an emetic, and one or two active purgatives, prescribes bark. The editor has seen, in the public services with which he has been connected, many cases of this fever; and the practice which he has the most favourable opinion of, consists in giving at first calomel and James's powder, and a cathartic mixture, followed by small doses of rhubarb and the hydrargyrum cum cretâ.—Ed.

SPECIES II.

EPANETUS MALIGNUS.

MALIGNANT REMITTENT.

PULSE SMALL, HURRIED, IRREGULAR; DEBILITY EXTREME; OFTEN WITH SIGNS OF PUTRESCENCE.

Extreme debility may be inferred from the symptoms of great weakness and irregularity of the voluntary motions; weakness of sensation; weakness and wandering of the mind; weakness of the pulse and of respiration; coldness and shrinking of the extremities, and a tendency to faint in an erect posture; nausea, vomiting, and a total disinclination to nourishment; difficult deglutition, depending upon an atony of the muscles of the fauces; involuntary excretions, depending upon an atony or paresis of the sphincters.

A putrescent state of the fluids may be determined from the following symptoms:—pulse quick and tremulous; heat of the surface sharp and pungent, giving to the finger a peculiar tingling for some minutes afterward; the skin parched, or soaked with sordid, fetid sweat; the smell offensive to a considerable distance; the breath hot and fetid; the mouth aphthous; the tongue clammy, fetid, livid, greenish-black; the lips swollen, puckered, cracked, and purple; the urine brown or blackish, and offensive; black discharge, often in profuse quantity, from the stomach; the stools blackish, colliquative, very offensive, parted with profusely and insensibly; the mind wandering; twitching of the tendons; swelling and tension of the belly; petechial spots, vibices, and hemorrhages from different parts, without proofs of increased impetus.*

This species may be traced under four varieties, each sufficiently marked by its own symptoms:—

α Autumnalis.	Autumnal Remittent.
β Flavus.	Yellow Fever.
γ Ardens.	Burning Remittent.
δ Asthenicus.	Asthenic Remittent.

The autumnal remittent is that which so frequently shows itself in our own country, in the season from which it derives its name, with a strong tendency to assume the tertian or double tertian type: or, in other words, with striking exacerbations every other day, or, where the double tertian is imitated, every day, the exacerbations commencing at noon, and the duration being usually under twelve hours; the intervals consisting of remissions, which, however, are not always very clearly determined. Where the double tertian type prevails, and the patient has to labour with two distinct sets of tertian exacerbations, it is obvious that one of

* No writer has given a better account of the fluids in their putrescent state than Dr. Dyckman.—See his Dissertation on the Pathology of the Human Fluids, New-York, 1814.—D.

these must take place every day, as it must occur in the remission of the other. Consequently, this variety is often mistaken for a quotidian remittent. But a little attention will point out the real nature of the disease. For, while the one set will usually be found distinguished from the other by evincing some difference in its duration or its violence, both will be distinguished from the quotidian by the time of their attack, which is at noon, while the quotidian attacks in the morning; and by the comparative brevity of the paroxysm, which is always under twelve hours, while that of the quotidian runs on towards eighteen.

The perfect apyrexy which takes place in the interval of intermittent fevers, gives the constitution a full power of recovering its energy and recruiting its sensorial supply; and hence there is great difficulty in accounting for a return of the paroxysm: I mean in cases in which the patient is removed from the miasmic atmosphere; for otherwise, the cause that commenced the disease will be present to continue it. Habit may possibly effect this after a recurrence of several paroxysms; but this will scarcely apply to the second, in which no habit can, with great strictness of language, be said to have taken place. In remittent fevers, however, something of this difficulty is removed; for the constitution, even during the remissive interval, is still struggling with disease, and has not an opportunity of recovering its sensorial power.

There is no perplexity in accounting for a greater tendency to febrile affections in the autumn than in any other quarter of the year: and this, whether we allow the operation of a specific febrile miasm from marshes or not. When the animal frame has for some months been exposed to the stimulus of a high atmospheric temperature, and not unfrequently, perhaps, to that of the direct rays of the sun, all its organs become relaxed and debilitated. The nervous energy* is diminished, or, in the language of Dr. Cullen, is in a state of collapse; a general languor and inertness prevail over every part of the system, and most of the functions are performed feebly and laboriously. And hence, if debility be the first stage of the proximate cause of fever, this part of the cause is continually present. But this is not all: the calorific rays of the sun act more powerfully upon some organs than upon others; and most of all upon the liver. The liver is hence in a state of perpetual irritation; and an unusual proportion of bile is secreted, a part of which is very generally absorbed and carried into the circulation; and, in tropical climates, so large a part as to form one of the causes of that tawny hue, by which the skin is there characterized: and as the greater proportion of the surplus often passes off by the bowels, we see an obvious foundation laid for that variety of diarrhœa which we have already described under the epithet of *bilious*. The liver, moreover, becomes weakened and torpid in proportion to its degree of excitement, and hence more disposed to congestion; and where congestion or any other obstruction takes place in a large organ, there is instantly a disturbance in the balance of the circulating fluid; and a disturbance which, in so irritable a state of the general system as we are now contemplating, can rarely exist without fever, or a tendency to fever.

There is no question that this general disturbance of the balance of the circulating fluid and increased excitement of the digestive organs may terminate in actual inflammation in some part of these organs, and especially in their mucous membrane:* and hence those pathologists who regard fevers of all kinds as consisting in inflammation, contemplate the remittent before us as an enteric, or gastric phlegmasia: but this, as we have already had occasion to observe, is rather to denominate it from its result than from its essential nature, and to make the cause and effect change places: a remark which will apply to yellow fever, as well as to the present variety.

All this mischief is apt to occur in autumns of temperate climates, that are peculiarly dry, and uniform in the range of the thermometer. But it often happens that even in the most temperate and healthy climates, like our own, the autumnal months are checkered with sudden vicissitudes of heat and cold: and the pools and rivers are suddenly inundated with equinoctial rains, overflow their banks, and cover a wide surface of land with stagnant water. And the animal frame has hence to contend against the dangers of invisible damps, and abrupt changes of temperature, as well as against solar excitement: all which become occasional causes of fever, operating upon a state of body already predisposed to its influence.

And hence, even without the existence of febrile marsh miasm, we see sufficient causes for a more frequent appearance of fever in the autumn than in any other season of the year: whence, indeed, one reason for its appearing in warm seasons in fleets that are cruising at a considerable distance from ports, as has been justly observed by Sir William Burnet.† But in many districts, perhaps even in some sporadic cases, we have reason to believe that marsh miasm does co-operate, and itself form the remote cause; and more especially where such cases are frequent, the residence a lowland, and the season hot and rainy. Dr. James John-

* The frequency of increased vascularity and ulceration of the mucous coat of the intestines in fever, has been amply proved by dissection.—See particularly Broussais Phlegm. Chroniques; Andral's Clinique Médicale, tom. i.; and Bright's Reports of Med. Cases, p. 178 et seq., 4to., Lond., 1827.—ED.

† On the Bilious Remittent of the Mediterranean. The occurrence of remittent and intermittent fevers in ships, far distant from marshy countries, may appear at first to furnish an argument against the doctrine of malaria, or marsh miasm, being always concerned in the production of such disorders; but those writers who maintain the truth of the latter view would remind their opponents of the malaria frequently issuing from the bilge-water, in which the decomposition of vegetable substances is going on.—ED.

son makes a like distinction between the causes of the ordinary endemic fevers of the east. "The fever in question," says he (bilious remittent), "frequently arises from atmospheric heat, or rather atmospheric vicissitudes, deranging the functions, or even structure, of important organs; and is, as Sir James M'Grigor supposes, sympathetic of local affection. Where marsh miasm is added, which is generally the case, then we have the endemic of the place, modified by the peculiar nature of the effluvia, and from which we are not secured but by local habituation to the cause."—(*Influence of Tropical Climates*, &c., 3d edit., p. 105.)

In consequence, the symptoms have often a close resemblance in both cases, so much so indeed, that when both diseases co-exist, it is sometimes found difficult to distinguish them. "The occurrences," says Dr. O'Halloran, "which preceded the appearance of the epidemic of Barcelona, in 1821, correspond with the old and recent observations on a similar subject in other countries; it almost invariably happening that the YELLOW FEVER of Spain is preceded by unusual diseases of various form and force; more particularly by BILIOUS REMITTENTS, which are not unfrequently so aggravated and MALIGNANT, that physicians themselves do not venture to define the lines of demarcation between them and the avowed epidemic."—(*Remarks on the Yellow Fever of the South and East Coasts of Spain*, &c., 8vo., 1823.)

There is still, however, a difficulty in determining why the type of any fever, hereby produced, should be remittent rather than intermittent or continued; and why its declinations should imitate one form of intermittents rather than another. Pathology has its mysteries as well as every other branch of science; and let the man who would accuse us of ignorance, because we are incapable of explaining these secrets of nature, first tell us, to adopt the language of Sydenham, "why a horse reaches his full growth at seven years old, and a man at twenty-one? or, why some plants flower in May, and others in June? If," continues he, "the most learned men are not ashamed to make an open avowal of their ignorance upon these points, I cannot acknowledge myself blameable if I modestly forbear reasoning upon a subject quite as difficult, and perhaps altogether inexplicable. At the same time I am persuaded, that the progress of nature is as certain and regular in these cases as in any others, and that the quartan and tertian intermittents are as subject to the natural laws, and as much governed by them, as any other occurrences whatever."

The autumnal remittent commences with lassitude, a general soreness over the body, yawning, inquietude, and most of the other concomitants of a febrile incursion. As some of the larger organs have been more affected by the influence of the season than the rest, we find them giving way in proportion. Hence the head is sometimes severely tried with pain or heaviness; the bowels are overloaded with bile, or the stomach is exquisitely irritable, and rejects whatever is introduced into it. Generally speaking, the stomach, from this symptom, suffers more than any other organ; and, along with the sickness, we have often a very troublesome and debilitating looseness, which resists every attempt to check its course. Sometimes, however, the bowels are costive from torpor, and the stomach is but little affected.

The violence of the symptoms is commonly in proportion to the violence of the incursion; but not the duration of the disease: for I have often seen a fever that commenced mildly and insidiously hold on for upwards of three weeks, while another that commenced with great severity, and threatened the utmost danger, has softened its aspect in a week, and entirely quitted the patient in a fortnight. The exacerbation ordinarily takes place at noon, or early in the afternoon, and consists in an increase of heat and pulsation, for there is rarely any preceding chill, and as rarely any salutary moisture when the heat diminishes. The early part of the night is hence peculiarly restless, and no part of it tranquil: the patient dozes perhaps for a few minutes, but without being sensible of sleep, and talks incoherently while dozing; the images before him being partly furnished from dreaming and partly from delirium. And even during these snatches of unquiet slumber, he is perpetually turning from side to side in quest of ease, which no position affords him. Every symptom is obstinate; laudanum rarely produces sleep, and no sudorific, perspiration; the coolest and most refreshing drink is rejected from the stomach; and if looseness tease the bowels, it is retained, as already observed, with great difficulty. It is hence of little importance what nourishment is offered, and every preparation seems almost equally to fail in supporting the strength of the system. In effect, the debility increases with every fresh exacerbation; and if no favourable change take place before the fourteenth or fifteenth day, there will always be reason for alarm. The progress of this disease is admirably described by Professor Frank (*De Cur. Morb. Hom. Epit.*, tom i., sect. 100, 8vo., Mannh., 1792), under the name of febris continua gastrica, the remittent form being with him, as with Dr. Cullen, a section of the continued fever.

In the case of a young lady in her seventeenth year, whom I lately attended, the attack was slight, and no serious evil was at first apprehended. The pulse was about ninety in a minute, and rather small; the bowels were relaxed, the motions bilious, and the stomach suffered from nausea. A gentle emetic seemed to afford some relief to the stomach, and a dose of rhubarb and calomel to the bowels; but the fever continued, with a daily and increasing exacerbation, for the most part at mid-day or soon after. The stomach again became irritable and sick, and the sickness was again connected with a diarrhœa, but the stools were colourless and watery, and nothing was rejected from the stomach but the diluent food that was swallowed. The skin was now very hot and dry, the pulse from a hundred to a hundred and twenty strokes in a minute, the nights were passed in perpetual

jactitation, or in short and talkative dozings. Opium, rhubarb, neutral salts, diaphoretics, and mild astringents, in almost every form and combination, were tried with very doubtful advantage, and the first with evident mischief. Anodyne injections were of as little avail; but sponging the limbs with cold water, or brandy and water, which was employed as well during the remissive as the aggravated symptoms, diminished the pungent heat, and for a time afforded some refreshment. Still the fever continued its career; the stomach retained nourishment with difficulty; the bowels were daily teased with six or seven watery evacuations; the pulse was quicker and weaker, and the nights without rest. The heart at length became oppressed with a sense of fulness rather than of throbbing; the lips were considerably swollen, ragged, and black; a hemorrhage occasionally issued from the nostrils and the fauces; and the general debility was greatly augmented. Such was the appearance towards the eleventh day. The tongue was not much furred; the pulse, though small, and rarely under a hundred and twelve, was steady; but the heat was intense, and the thirst unquenchable. The mineral acids in dilution, sometimes singly, and sometimes in the combined form of aqua regia, with acidulated beverages, were now chiefly trusted to, in connexion with farinaceous foods, jellies, and beef-tea; and cold water was permitted in any quantity. This plan was continued till about the eighteenth day; when every thing allowed being rejected, and every evacuation accompanied with faintness, it appeared to me that the plan should be changed; that the chief cause of irritation was at this time debility; and that a more stimulant treatment should immediately be commenced. My colleagues, for whom I have a high respect, acceded with reluctance, as conceiving that we should only exasperate the febrile symptoms; and that, if the stomach could not retain tasteless things, it would instantly reject wine, or convert it into an acid. The attempt, however, was made; sound old Madeira was administered by teaspoonfuls, and shortly afterward a small portion of chicken-jelly. Both remained on the stomach; but the diarrhœa continued; and for this, as modern preparations had proved of little use, I recommended a scruple of the confectio Damocratis in half an ounce of cinnamon-water after every loose motion. The diarrhœa ceased as by a charm; the ensuing exacerbation was less marked; the night was passed more tranquilly, and columbo, in small doses of the powder, was commenced the next morning, and persevered in. The change of treatment, being thus found to succeed, was adhered to, and the patient slowly, but effectually recovered.

It is not often that the autumnal remittent is thus obstinate. But, whether there be sickness or not, an emetic should be administered, as one of the best means of determining towards the skin. And, singular as the advice may appear, it is rather to be recommended where there is little or no sickness than where the sickness is incessant; for, in this last case, the stomach is often so extremely irritable that emetics only exasperate it, and add to the distress. It will also be useful to evacuate the bowels on all occasions, though the emetic alone will frequently be sufficient for this purpose, and hence Stoll allows of nothing beyond: for purging, says he, augments the fever, while an emetic strangles it as at a blow.—(*Rat. Med.*, part i., p. 227.)

The use of the lancet must depend upon the circumstances of the particular case. Where the onset is violent, and particularly where the patient is plethoric or of a vigorous habit, it should be employed instantly and freely; for, without it, from the urgency of the symptoms, there can be little doubt that some large organ or other will soon become locally affected with effusion or congestion, which is always to be avoided as one of the worst symptoms that can occur. And, if we have reason to believe that such local affection exists at the time of the attack, and, more especially, that it is the cause of it, copious depletion will be still more necessary; for, in this case, we have not only to contend with the fever, but to guard against phlogosis or inflammation in the infarcted organ.

But, except in such cases, there is no call for the lancet, and we may concede to Stoll that its use is injurious. [According to the observations of Dr. Bright, a tongue with red edges, more particularly when dry, almost universally indicates in fever great irritation of the mucous membrane of the intestines; and, when combined with loose, yellow, gritty dejections, generally denotes ulceration, or a state approaching to it. In this state, leeches and blisters may be applied to the abdomen; and the medicine in which Dr. Bright seems to put most faith consists of small doses of ipecacuanha, the hydrargyrum cum cretâ, and pulv. cretæ comp., generally in the proportion of a grain of the first, three of the second, and ten of the last article. The oleum ricini, with a few drops of tinct. opii, he prefers as the safest aperient. Two grains of hydrarg. c. cretâ, and ten of confect. opii, made into pills, and to be taken thrice a day, are also sometimes prescribed, with mucilaginous saline medicines, and ten or fifteen drops of vinum ipecac. to each dose.—(*Bright's Reports of Medical Cases*, p. 178, &c., 4to., Lond., 1827.)] Copious diluents, and small doses of antimonial powder in effervescing neutral draughts, will ordinarily take off the burning heat of the skin by exciting a breathing moisture; and, if this can be maintained through the day, the ensuing exacerbation will probably be mitigated in its violence. If not, eight or ten drops of the tincture of digitalis should be added to the antimonial draught, and all tendency to sickness be restrained by a few drops of laudanum; keeping the bowels in the mean time open with some gentle laxative, as rhubarb and the sulphate or supersulphate of potash in combination. Blisters are never of service, except when topically called for, or as stimulants in the last stage of debility. If the diaphoretic plan fail of effect, and the heat be pungent and augmentive, acids, vegetable, mineral, or both, will ordinarily constitute the best sedatives and refrigerants; and, where the debility is extreme,

the stimulant plan should be had recourse to, which is laid down in the preceding case.*

One of the severest and most fatal forms under which the malignant remittent shows itself is that of the YELLOW FEVER, constituting the SECOND VARIETY of the present species; so denominated from the lemon or orange hue which is thrown over the entire surface of the body, almost from the first attack of the disease, and which gives it a distinctive feature. The heat is here also intense, the thirst extreme, and the vomiting strikingly obstinate, but not, as in the preceding species, consisting of a colourless material, or the food that has been swallowed, but of a yellowish matter at the beginning and through the height of the fever, and of a chocolate-coloured colluvies towards its close.

The common remote cause of this fever is unquestionably marsh miasm; and hence it holds a stationary abode in the swampy soils and morasses of the intertropical regions, exposed to a high solar heat, and perpetually exhaling a decomposition of animal and vegetable materials: and is found occasionally in all climates that make an approach to the same character; where, in the correct picture of the poet,—

"The rivers die into offensive pools,
And, charged with putrid verdure, breathe a gross
And mortal nuisance into all the air."

It is nevertheless a striking fact, that, although such "mortal nuisances" have been exhaled into the atmosphere in all ages within the range of the tropics, the fever we are now entering upon is only of modern date in its malignant form. Whether this be owing to any degree of general change that has taken place in the human constitution, or to a larger accumulation of that mixed animal and vegetable compost which forms the hotbed of the present destructive miasm, or to any other cause, it is difficult to determine. It certainly seems, as Sir Gilbert Blane has observed, to have some bearing upon the slave-trade, with which it is precisely coetaneous. Smallpox, syphilis, and rickets, were equally unknown to the ancients; yet the causes of their origin, as, indeed, those of all other epidemic or constitutional diseases, are involved in inscrutable darkness; and, in the language of the poet,

—"Noctescunt tenebris caliginis atræ."

The yellow fever first showed itself, so far as we have any record of its origin, at Barbadoes, in 1647, whence it spread to various other West Indian Islands, and at length made its appearance at Boston, in North America, in 1693, to which place it was carried from Martinique by the fleet under Admiral Wheeler. In Europe, its earliest footsteps were traced at Lisbon in 1723 (*Sir Gilbert Blane, Select Dissertations*, &c., p. 284, Lond., 8vo., 1822): after this period, it seems to have declined as well in its violence as in its visits, to the same regions, particularly in respect to North America and Europe. But, in 1793, a new era of its prevalence commenced; the disease showing itself then and down to the present day with a frequency and fatality it had never evinced before, especially in the West Indies and North America. This aggravated form, however, did not manifest itself in Europe till the year 1800, when, after an interval of six-and-thirty years, it appeared at Cadiz in all its horrors. Since this period, it has visited Cadiz several times, and has hence spread to neighbouring seaport towns in the south of Spain, at short intervals. Among other places in this line of coast, it has repeatedly visited Gibraltar, first in 1804, when more than one third of the garrison and population were carried off; and occasionally since, but with little comparative loss, on account of those precautionary means which had been entirely neglected on the first visitation.

To what extent the miasm of yellow fever, as it arises from its swampy and putrescent base, may spread, before it becomes dissolved and decomposed in the surrounding atmosphere, it is not easy to determine. "It is probable, however, that, where a tradewind or monsoon sets over a large tract fraught with febrific miasmata, these invisible agents may be carried to a much greater extent than where calms or gentle sea and landbreezes prevail. This is exemplified in the fever of Corimbatore, and ought ever to be borne in mind by navigators in anchoring ships in the vicinity of swamps, or by generals in pitching tents or stationing troops."—(*Influence of Tropical Climates*, &c., by J. Johnson, M. D., 3d ed., p. 148.)

It is also satisfactorily proved, that the modification of miasm producing yellow fever does not spread so far, or rise so high, and, consequently, is not so volatile, as that producing the ordinary bilious remittent of hot climates; a feature by which it makes a nearer approach to the miasm of human effluvium, and shows that affinity to it, even from the first, which we have endeavoured to establish in the introductory remarks to the present order. Dr. Ferguson has given us a striking illustration of the truth of this remark, as also of the relative barometrical elevations of the respective regions of yellow fever, ordinary bilious remittent, and a pure and healthy atmosphere, in the following passage, in which he is taking a medical periscope of the Island of Antigua. "The autumn of 1816 became very sickly, and YELLOW FEVER broke out in all its low marshy quarters, while the MILDER REMITTENT pervaded the island generally. It was the office of the white troops to take the guards and duties of the dock-yards among the marshes below; and so pestiferous

* The treatment of the autumnal remittent, as stated above, is perhaps judicious enough for most cases, but it is not so efficient as that generally pursued by American practitioners. Bloodletting, leeches, emetics, cathartics, and calomel, are among their prominent remedies; the febrifuge compound of calomel and James's powder, is much used. Blisters are often applied during the continuance of the active character of the disorder, and after depletion. When the complaint, however, assumes a more malignant and typhoid character, these active remedies must be used with great circumspection.—D.

was their atmosphere, that it often occurred to a *well-seasoned soldier*, mounting the night-guard in perfect health, to be seized with furious delirium while standing sentry, and, when carried to his barracks on Monk's Hill, to expire, in all the horrors of the black vomit, within less than thirty hours from the first attack: but, during all this, not a single case of yellow fever, nor fever of any kind, occurred to the inhabitants of Monk's Hill (a rock rising perpendicularly above the marshes to the height of six hundred feet). The result on the ridge (a hill about a hundred feet lower) was not quite the same, but it was equally curious and instructive. The artillery soldiers, seventeen in number, never took any of the night-guards, but they occupied a barrack about three hundred feet above the marshes, not perpendicularly above them, like Monk's Hill, but a little retired. Not a case of yellow fever or black vomit occurred among them; but every man, without a single exception, suffered an attack of the ordinary remittent, of which one of them died: and, at the barrack on the top of the ridge, at the height of five hundred feet, and still further retired from the marshes, there scarcely occurred any fever worthy of notice."*

There is another feature in which the miasm of the yellow fever shows its affinity to the febrile contagion of the human frame, and evinces its less diffusibility; and that is, in readily attaching itself to whatever bodies it meets with, though to some more than others. Even the leaves and branches of trees form powerful points of attraction, and, where they are in the immediate vicinity of a swamp, retain the contagious matter that rests upon them so effectually, as, in many cases, to keep the surrounding atmosphere free from pollution, and become a safeguard against febrile attack. "The town of New Amsterdam, in Berbice," says the same writer, "is situated within a short musket-shot to the leeward of a most offensive swamp, in the direct track of a strong trade-wind that blows night and day, and pollutes even the sleeping apartments of the inhabitants with the stench of the marshes; yet it brings no fevers, though every one is well aware that it would be almost certain death for a European to sleep, or even to remain after nightfall, under the shade of the lofty trees that cover the marsh at so short a distance. All, too, are equally aware, that to cut down the trees would be a most dangerous operation in itself, and would certainly be productive of pestilence to the town."

As almost every territory in which the fever hereby produced has committed its ravages has given it a new name, it is as gorgeously arrayed with titles as the mightiest monarch of the east. From the depredations it has committed in the West Indies and on the American coast, it has been called the St. Domingo, Barbadoes, Jamaica, and American fever; and, from its fatal visitations on the Guinea coast and its adjoining islands, the Bulam fever. In British India, it is distinguished by the name of the jungle fever, the Hoogly fever, or endemic of Bengal; and, still farther to the east, by that of mal de Siam. Nearer home, in the lowlands of Hungary, and along the south of Spain, it is called the Hungarian or the Andalusian pestilence. From its rapid attack on ships' crews that are fresh to its influence, the French denominate it *fièvre matelotte*, as the Spanish and Portuguese call it *fiebre amarilla*, and still more frequently *vomito prieto*, or black vomit, from the slaty or purplish and granular saburra thrown up from the stomach in the last stage of the disease; while, as its ordinary source is marsh lands, it has frequently been named *paludal fever*. Its more common name, however, in the present day, and for the reason already assigned, is yellow fever; and, when the attack upon new-comers is slight, *seasoning*. It is the *febris gastrico-nervosa* of Professor Frank (Op. cit., vol. i., § 103), who justly regards it as an intense variety of the ordinary autumnal malignant of temperate climates, as already described under this name.

From its showing itself in so many parts of the world, and under circumstances so widely different, it is not to be wondered at, that it should often be accompanied with a considerable diversity of symptoms; and, consequently, that the paludal fever of one quarter should be regarded by many writers of considerable authority as essentially different from that of another. But an attentive perusal of the origin and laws of febrile miasm, as I have endeavoured to explain them, when treating of the remote cause of fever, will, I trust, be sufficient to account for all such local distinctions; and, if not to prove, at least to render it highly probable, that they depend "partly upon the state of the body at the time of attack, but chiefly upon some modification in the powers or qualities of the febrile miasm itself, by the varying proportions of the co-operative agents of moisture, heat, stagnant air, and other auxiliaries which have not yet been detected, in their relation to each other in different places and seasons."

How far the yellow fever is capable of *origination* from any other cause than febrile miasm from marshy lands, or places subject to like decompositions and plays of chymical affinity, we cannot at present determine. Such places, however, are numerous, as damp unventilated stations, stagnant water, thick impervious jungles, and woods that arrest the miasm as it ascends; even high and arid hills after heat and rain; but, above all, a foul state of the hold on board ships, whatever be the cause of such impurity. "Ships," observes Dr. Chisholm, "containing wine in their holds in a state of decomposition, are generally extremely sickly, and the character of the prevalent disease is that of YELLOW REMITTENT FEVER. Several instances of this took place in Fort Royal Bay in the years 1797 and 1798; and the situation of the ships in the open bay, far

* On the Nature and History of Marsh Poison, Medico-Chirurg. Rev., Dec., 1821; and compare with Chisholm on Tropical Climates, p. 34.

from the influence of marsh effluvia, precluded a suspicion of the fever from that cause. The ship Nancy, Captain Needs, from Fayal, with a cargo of wine for the army, arrived at Fort Royal, Martinique, in the month of October, 1798: she met with a gale of wind at sea on the 17th September, and several of the casks, from the motion of the ship, became leaky. The captain was taken sick at sea, and died with every symptom of the highest grade of yellow remittent fever. The mate and several of the crew were attacked with the same complaint: they recovered; but a mate, shipped at Fort Royal, fell ill on board and died. The ship lay out in the open bay; no vessel near her was sickly; and she herself became very healthy after the cargo was landed."*

Heat alone, however high the temperature, is not a cause of the fever before us: there must be moisture; and, as the result of both, a rapid decomposition and exhalation of organic remains. Provided the air is dry, even tropical climates are often found salubrious. "The burning province of Cumana," observes M. Humboldt, "the coast of Cora, and the plains of Caraccas prove, that excessive heat alone is not unfavourable to human life."

It has just been observed, however, that even high and arid situations, after heat and rain, may also furnish, by the chymical decomposition of their soil, the specific miasm of yellow fever: and it may here be added, that if, by the violence and redundance of the rain, the swampy low grounds be at the same time overflowed, the latter will become an arena of health, while the heights are the seat of disease. Such the hilly ravines of Portugal were occasionally found by the British army, during its occupation of that country in the summer of 1809, when a most destructive remittent suddenly made its appearance, while the overflowed swamps at its feet were more than usually free from disease: "and such is frequently the case," as Mr. Irvine has justly observed, "on the lofty ridges of Sicily, when their fiumari or watercourses, which are ordinarily dry and used for roads in the summer months, are filled and inundated with sudden torrents of rain. For here the malaria changes its station, and quits the overflowing lowlands for the heights of the primitive hills."†

But, whatever be the original source of the fever before us, when once it has established itself and rages with severity, it is now very generally admitted, that the effluvium from the body of the affected "is loaded with miasm of the same kind, completely elaborated as it passes off,"—and that the disorder is from this time capable of communicating itself by contagion. And, from the statement already given, it appears far more probable, that the fever at Cadiz in 1800, that at Malaga in 1803, and that at both in 1820, had their *origin* in contagion, or, in other words, in febrile miasm, produced by a decomposition of the effluvium from the human body, than from the same miasm issuing from a decomposition of marsh lands. And, on this account, I have rather preferred the trivial name of *yellow* to that of *paludal* fever, which is too limited to express its source in every instance. The yellow fever at Xeres is ascribed by Don J. A. Ferrari entirely to this cause, as produced by importation; but its primary source he attributes to the decomposition of swampy lands, or other sources of putrefaction, which he seems to suppose may exist even in some parts of Spain.—(*Edin. Med. and Surg. Journ.*, July, 1823, p. 369.)

In all instances it has a near approach to the autumnal remittent we have just described. Dr. Rush contemplates them as merely different degrees of the same disorder; but Dr. Bancroft is, as it appears to me, more correct in considering them, after Professor Frank, as "varieties of one disease" (*Essay on the Disease called Yellow Fever*, &c., Baltimore, 1811), in unison with the present arrangement.

It should be observed, however, that, for the yellow fever to become contagious, it seems necessary that the thermometer should be above 80° of Fahrenheit: since, like the plague, it demands, for the activity of its miasmic corpuscles, a certain range of temperature, below which it ceases to operate, and its specific particles, perhaps, generally become decomposed. It has never been known in North America nor in the south of Europe, but at the season of the year in which tropical heats, that is, those of 80° or upwards, prevail; and it has never failed to disappear in winter, even in the mild winter of Spain: though typhus may at the same time hold its full career of malignity.*

* Essay on the Malignant Pestilential Fever, vol. i., p. 279.—See also Dr. Dickson's Topographical Remarks, &c., sect. iii.

† These facts confirm the observations introduced in a previous part of this work, in explanation of the occasional prevalence of agues in elevated parts of the country, or even on hills, while lower situations continue healthy. They also tend to refute the opinion of the identity or affinity of marsh miasm and of contagion from human effluvia to one another, inasmuch as one argument frequently adopted in favour of the latter hypothesis is founded upon seeming anomalies in the circumstances under which agues commence.—Ed.

* Blane, Select Dissertations, &c., p. 314. Is not this a strong fact against the contagious nature of yellow fever? The proof of the extension of the disorder by the contagion of human effluvia must be exceedingly difficult, as long as the parties who are imagined to contract the fever from those first affected, are exposed to the influence of the same local circumstances. The notion of intermittent and remittent fevers being capable of transmission from one person to another by contagion, is, in all probability, as erroneous as the belief, prevalent in Italy, Malta, and other parts of the south of Europe, that consumption is a contagious disorder. When I was at Malta, in 1801, I wished to procure a lodging for an officer labouring under phthisis, but, owing to the belief universally entertained in that island of the disease being contagious, it was with great difficulty that any family could be persuaded to afford him accommodation. With regard to the malignant remittent fevers so often prevalent on the coast of Spain, it is a fact, that, although the commissioners sent by the French government to

From the different impressions produced on febrile miasm under these diversities of origin and adjuncts, we find, independently of other discrepances, that the fever it excites sometimes assumes a caumatic or inflammatory cast, sometimes a typhous, and sometimes a synochous, or, in other words, begins with the first and runs rapidly into the second or third. And it is in effect into these three subsections that the Andalusian yellow fever has been lately restored by Dr. Jackson, in his excellent work on the subject. Generally speaking, the variety before us evinces the last of these characters, as does also the variety we have just treated of: the two varieties that yet remain, will afford examples of a typhous and inflammatory bearing.*

Its ordinary progress, among those who are fresh to the tainted atmosphere, is thus accurately described by Dr. Mosely, who, from its resemblance to the causus of Hippocrates, denominates it *endemial causus*: a term which has since been adopted by Dr. M'Arthur (*Account of the Causus or Yellow Fever of the West Indies*, &c.), and several others. "When a new-comer is seized with a sudden loss of strength, and a desire of changing, for rest, into every position, without finding it in any, those symptoms which constitute the *endemial causus* may be expected. The following day, but sometimes within twelve hours from the first indisposition, the violence of the disease will commence thus:—There will be a faintness, and generally a giddiness of the head, with a small degree of chilliness and horror, but never a rigour. Then immediately will succeed a high degree of fever, with great heat, and strong beating in all the arteries of the body, particularly observable in the carotid and temporal arteries; flushings in the face; gaspings for cool air; white tongue, but tinged with yellow, after the retchings have commenced; excessive thirst, redness, heaviness, and burning in the eyes; heaviness and darting pains in the head and small of the back, and often down the thighs; pulse quick, generally full and strong, in some cases, quick, low, and vacillating; skin hot and dry; sometimes with a partial and momentary moisture; sickness of the stomach from the first, which increases with the disease; and, immediately after any thing is taken to quench the thirst, retchings succeed, in which bilious matter is brought up; anxiety, with stricture, soreness, and intense heat about the præcordia; great restlessness; heavy respiration; sighing; urine deep-coloured, and but little in quantity. This is the first stage of the fever, and may continue twenty-four, thirty-six, forty-eight, or sixty hours, and this constitutes its inflammatory period.

"The second stage begins with an abatement of many of the preceding symptoms, and the rise of others; sometimes with a deceiving tranquillity, but with perturbation if the patient should fall into a sleep: then a yellow tinge is observed in the eyes, neck, and breast; the heat subsides, and sometimes with a chilliness, but not with that sort of strong rigour which, when it happens, terminates the disease by sweat, or by copious bilious evacuations upwards or downwards. The retchings are violent, and turn porraceous; the pulse flags, but is sometimes high and sometimes soft; the skin soft and clammy; the urine in small quantity, and of a dark croceous colour; the tongue in some cases is dry, harsh, and discoloured, in others furred and moist; there is confusion in the head, and sometimes delirium, with the eyes glassy. This stage of the disease sometimes continues only for a few hours, sometimes for twelve, twenty-four, thirty-six, or forty-eight hours, but never longer.

"In the third and last stage of the fever, the pulse sinks, and becomes unequal and intermittent, sometimes very quick; frequent vomiting, with great straining and noise, and what is brought up now is more in quantity, and has the appearance of the grounds of coffee, or is of a slate colour. Nothing can be retained in the stomach; difficult breathing; tongue black; cold clammy sweats; eyes hollow and sunk; yellowness round the mouth and temples, and, soon after, over the whole body."

In the earlier remissions, the pulse often sinks from a hundred and thirty to ninety, and the general improvement is so considerable as to impress the young practitioner with the belief of a salutary crisis. He is soon, however, aroused from his deception, for the exacerbation soon returns with renewed violence; and, as the symptoms grow more aggravated, they are, in the end, accompanied with subsultus tendinum, black urine, deadly coldness of the limbs, delirium, faltering speech, hemorrhage, or oozing of blood from the mouth and nostrils, corners of the eyes and ears; black bloody vomiting and stools; vibices, hiccough, muttering, coma, death.

After the first prostration of strength produced by the symptoms of invasion or accession, the *prodromes* of M. Deveze, the disease runs

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investigate the character of the fatal disorder which, in 1821, raged in the city of Barcelona, reported that it was propagated by infection, the doctrine never gained much belief in France, because it was considered to be sufficiently refuted by other views taken of the same epidemic by Dr. Chervin, whose able researches fully established the fact, that the propagation of the fever was chiefly, if not entirely, owing to the malaria of the place in which it prevailed, and not to emanations from those affected by it.—ED.

* Here it ought to be noticed, that the contagious nature of typhoid fevers is a disputed point. If you allow the effluvia from too many human beings crowded together in a badly ventilated building to be, as it were, concentrated, you will see fever arise; but for typhus to be communicated to another person from a patient lying in an airy apartment, is a circumstance, at all events, so rare, as to be a matter of doubt. Whether the patients, crowded together, have one fever or another, or at first no fever at all, febrile disorders, with change of type if they have previously existed, will generally come on. The inflammations and alterations of the mucous intestinal tissues, and other parts, arising in the course of intermittent and remittent fevers, together with the influence of medical treatment, will also frequently account for change of type.—ED.

on violently through its stage of excitement till the sensorial power is exhausted. Through its entire course, till the patient is sinking, the intellect is not particularly disturbed, and the organs chiefly affected are the abdominal; those which principally suffer in the malignant autumnal remittent of our own country, are especially the stomach and the liver. Hence, the intense heat and anxiety about the præcordia, the saffron die of the urine, the yellow teint of the skin, and the vomitings, first of a bilious, and afterward of a chocolate or sanguineous colluvies. In the Andalusian variety, however, according to Dr. R. Jackson,* the brain is sometimes the first organ affected, and the abdominal organs consecutively.

In some cases, the disease opens with great vehemence, and rushes forward at once to its acme, constituting the second stage of Dr. Mosely. The patient is sometimes cut off in four-and-twenty hours: and, from the violence so suddenly committed on the liver, its proper function is instantaneously suspended,—and, instead of an excessive emulgence of high-teinted bile, a chlorotic secretion takes place, which, forced into the sanguineous system, gives a ghastly lividity to the entire surface. Shortly after which, if the patient live long enough, the gorged bloodvessels of the inflamed and gangrenous liver itself, and sometimes also of the spleen or stomach (*Chisholm*, op. cit., p. 36), give way, and repeated tides of dark, granulated grume, like the grounds of chocolate, are ejected by the mouth.

Dr. Pym has very forcibly described this overwhelming onset of the disease in the following terms:—"There is, *at the first attack*, a peculiar shining or drunken appearance in the eyes; the headache is excruciating, and confined to the orbits and the forehead; has no remissions; when it terminates favourably, is rarely attended with yellowness of the skin, which, if it do take place, is of a very pale lemon colour. It runs its course from one to five days, is attended with a peculiar inflammation of the stomach, which, in most cases that prove fatal, terminates in gangrene, or in a diseased state of the internal or villous coat of that organ, accompanied with a vomiting of matter resembling coffee-grounds, and a livid or putrid appearance of the countenance which it is impossible to describe; but those wishing to form an idea of it, may see its fac-simile in the countenance of any person with a florid complexion, during the burning of spirit of wine and salt in a dark room, as is practised in the game of snapdragon during the Christmas gambols."—(*Obs. upon the Bulam Fever*, &c., 8vo., 1815.)

In this state, the disease is unquestionably for the most part, though not always, contagious: and, as Dr. Cullen has laid down contagion as a distinctive character of fevers originating from human effluvium, in contrast with those originating from the effluvium of marshes, Dr. Pym has endeavoured to draw a line of distinction between yellow fever in this state of intensity and in its ordinary career; contending that the former (to which he limits the name of Bulam fever) is in every instance derived from human effluvium, and, consequently, that the two must of necessity be distinct diseases. And to make the distinction still clearer, he has ventured to assert, that the symptom of a more pallid or bloated countenance, together with that of black vomit, or the discharge of coffee-like grounds from the stomach, is peculiar to the contagious fever, and is rarely, if ever, an attendant on that produced by marsh miasm, even in its most impetuous and fatal course.

This distinction, however, is in both instances at variance with the history of the disease as it has occurred in most other parts of the world, and, more especially, with respect to the symptom of black vomit; which, in its last stage or severer incursions, is common to it from whatever source derived. Nothing is more frequent in the Andalusian or Spanish variety, where the discharge is sometimes inky-black, like the fluid disgorged by the cuttlefish; and it is thrown forth from the anus as well as the stomach.—(*Jackson*, op. cit.) Black vomit occurred more especially in the fatal epidemic of Antigua in 1816, which was decidedly an offspring of marsh effluvium. "The island had for some years," observes Dr. Musgrave (*Medico-Chirurg. Trans.*, ix., 92), at whose description we have already glanced slightly, "been peculiarly healthy; and the disease first showed itself in a swampy part of it, and amid new-comers, who were sailors, but from a healthy ship, and themselves in good health on first landing. It soon spread widely, and at length indiscriminately among all ranks, and conditions, and situations; among blacks and whites, the newly-arrived, and the oldest settlers in town and country."

Nothing was better calculated than this fever, to show that almost all the different kinds of fever that occur to us are capable of issuing from a common source of miasm, merely modified by contingencies; for, in Antigua, they all occurred in different individuals. The disease sometimes *commenced* as an intermittent or remittent, and sometimes in a continued type; it sometimes ceased in four or five days, which was its usual course, and sometimes *terminated* in an intermittent. The head was in some cases chiefly affected; in others the stomach, liver, or some other organ: sometimes the patient died without hiccough or black vomit, though he rarely recovered where these symptoms appeared; Dr. Musgrave recollects but one instance. Recovery was no exemption against a second attack. In new-comers, the teint was of a lemon hue; in native or assimilated constitutions, of a deep orange. The state of the atmosphere at the commencement of the disease presented nothing peculiar.

To the same effect, Dr. Dickson, in his valuable official report:—"At Barbadoes and Antigua, I had generally seen the disease of an ardent and *continued* form, and did not fully understand why authors talked of a bilious *remittent* yellow fever, until after the capture of

* Remarks on the Epidemic Yellow Fever, &c., on the south coast of Spain, 8vo., Lond., 1821.

the French and Danish islands. But the anomalies of fever, the shades and changes which it assumes, according to the intensity of the exciting causes, the state of predisposition, or the spot of residence, could nowhere be more strongly portrayed, than in the destructive epidemic of Mariegalante in the autumn of 1808, from the most concentrated marsh miasmata; where the different types of fever were CONVERTED into each other, of the worst and most aggravated species I have ever witnessed. Yellow fever in the *continued form;* others with comatose *remittents* or *intermittents;* the exacerbations of which were so violent as to carry off a patient in two or three paroxysms; while others sunk into a low protracted character of fever, resembling *typhus*."—(*Report*, &c., pp. 143, 144.)

In the midst, however, of so much discrepance, there is still much that is concurrent, and quite enough to establish the identity of the two diseases, if an abundance of other evidence to the same purpose were not at hand. The fever of Dr. Pym, specifically characterized by black vomit, is represented as being peculiarly dangerous and fatal; in that of Dr. Musgrave, this symptom only occurred in the most perilous cases. According to the latter, the severest and most deadly attacks were among the newcomers; the mildest among the natives, or those whose constitutions were assimilated to the climate. The yellow hue of the former (and I have already endeavoured to account for this) was of a *deep orange;* that of the latter, a *lemon colour*. Dr. Pym describes three species of fever as common to warm climates, but which differ from each other in their mode of origin and diagnostic character. In that of least danger, the colour of the surface, he tells us, is of "a *very deep yellow*;" in that of higher danger, it is of "a *deep yellow*;" and in the disease before us, which is by far the most fatal, where there is any yellow at all, it is of "a *very pale lemon colour*;" which is, in effect, the very hue ascribed to the severest cases of the Antigua fever by Dr. Musgrave, as the "very deep yellow," or "orange," is to the mildest. So that, examined by their external livery, as well as their internal disorganization, there can be no doubt that the two diseases are the same. Dr. Pym appeals peculiarly, as a distinctive character of the Bulam fever, to the deadly and chlorotic paleness exhibited by the countenance in its latest stage, or most fatal incursion. But even this only shows that, in such case, the disease makes a mortal attack upon the larger viscera, and especially the liver, from the first; and demonstrates the proposition I have ventured to lay down, that, in proportion as this organ is severely affected, is its inability to secrete proper bile, or indeed bile of any kind; and, consequently, that if the irritation only reach a certain point, its secernents will be stimulated to emulge a larger quantity and of a deeper hue; a considerable portion of which will be absorbed into the sanguiferous system, and produce the orange tinge, which, in the description of both these writers, peculiarly marks the disease before us in its less fatal attacks: while, if the febrile incursion be so violent as totally to derange the function, and still more the structure of the liver, no bile will be secreted at all, or, if secreted, less in quantity, and consequently less diffusive in colour; and hence only conveying a chlorotic or livid tinge to the face, which, at the same time, exhibits a bloated fulness from effusion or debility of vascular action.

In confirmation of this remark, Dr. Jackson's earlier cases of practice furnish numerous examples;—"examples indeed," to adopt his own words, "of that form of disease when there is a considerable degree of vascular excitement in the early stage, terminating commonly by deranging the functions of an organ of importance—most frequently the liver or stomach. Yellowness and black-vomiting are common; and it is *more especially* to this form, that the name of YELLOW FEVER has been applied: but though the yellowness and black-vomiting be common, they are *not constant* and essential. Determinations sometimes change suddenly; the brain becomes overwhelmed, and stupor and convulsion then cut short the ordinary rapid course."—(*Hist. and Cure of Fever*, chap. iv., p. 133.)

Yet, after all, it is not denied by Dr. Pym, nor, so far as I know, by any of the writers on the American or Andalusian fever, that the yellow fever from marsh miasm ever evinces either of the symptoms that are so essentially ascribed to the bilious remittent produced by contagion, but only that "it is rarely, if ever," to adopt Dr. Pym's own words, "attended with the fatal symptoms peculiar to the Bulam fever, viz., the black vomiting, and a peculiar bloated appearance of countenance"

There would, however, be an almost insurmountable difficulty in reconciling these different descriptions of the same disease, in consequence of Dr. Musgrave's telling us, very decisively, that not a single instance occurred in the Antigua fever of its being received by contagion, were there not strong reason for believing that this explicit writer suffered himself to be deceived upon this point; most probably, like Dr. Pym and Dr. Jackson, from too close an attachment to the doctrine laid down by Dr. Cullen, that the fever from marsh miasm does not produce contagion, which is specifically a result of a fever from human effluvium.

It is impossible to peruse the history of bilious remittents in warm climates, offered from all quarters, without seeing that it may originate from both sources; each sometimes operating alone, and sometimes in conjunction with the other, as was probably the case at Antigua, and certainly the case in the yellow fever that raged at Philadelphia in 1793, in which, says Dr. Rush, there were, for several weeks, two sources of infection, viz., exhalation and contagion. The exhalation infected at the distance of three and four hundred yards, while the contagion infected only across the streets. The more narrow the streets, the more certainly the contagion infected. Few escaped it in alleys. After the twelfth of September, the as-

mosphere of every street in the city was loaded with contagion; and there were few citizens in apparent good health who did not exhibit some mark or other of it in their bodies, particularly a preternatural quickness in the pulse, "which occurred in negroes, as well as in a few who had the disease before."

In like manner, the Minorca fever, uniformly originating, as Dr. Boyd observes, in marsh miasm, frequently becomes contagious (*De Febre Minorcæ*, &c., 1817): of which, indeed, he has furnished us with a striking example in his own person: for we are told by Dr. Denmark that he caught the fever from one of his patients, and nearly fell a victim to it.—(*Medico-Chirurg. Transact.*, vi., 301.) But we have had occasion to examine this subject so much at length, in the introductory remarks to the present order, that it is unnecessary to pursue it further, except by introducing the following irresistible illustration:—

Sir Gilbert Blane, having been requested by the Board of Admiralty to examine into the dreadful mortality that took place at the Island of Ascension, in the summer of the present year, 1823, reported, and from the manuscript of this report I was permitted to copy, that the officers and privates of Ascension Island were first stationed there in September, 1821, in number twenty-eight, and continued in such full health as to be without the loss of a man till the arrival of the Bann sloop of war, in May, 1823. The Bann had left Sierra Leone towards the close of the preceding March, at which time the yellow fever was raging there with great mortality, and, at the time of sailing, had had no sickness of any kind on board: but, within a few days after sailing, the yellow fever made its appearance, and continued its ravages till the beginning of June: during which time, not less than ninety-nine men had been attacked by it, and thirty-three cut off, out of a crew of one hundred and seven Europeans and officers, independently of twenty-seven African supernumeraries, none of whom suffered from the disease. Upon the arrival of the Bann at the Isle of Ascension, an unrestricted communication took place between the sick crew and the healthful garrison, the medical officers of the station having adopted the opinion that the yellow fever is uncontagious. For want of such restrictions, within a few days after the arrival of the Bann, the garrison became affected, now reduced from twenty-eight to twenty-two, in consequence of six men having been ordered to a distant part. And, such was the dreadful mortality with which the disease raged, that, out of this garrison of twenty-two officers and soldiers, not less than sixteen died, being rather more than three fourths of the whole. The medical officers were soon, though too late, convinced of their delusion, and most unreservedly admitted the quality of contagion; and that the disease they were called to contemplate was genuine yellow fever, will be placed beyond a doubt by the two following symptoms, that the surgeon of the Bann particularly notices as among its other characters:—"the skin tinged with yellow, assuming a deeper and deeper hue," and, "before death, the vomiting of a dark-coloured fluid, like coffee-grounds;" conjoint symptoms, which, as Sir Gilbert Blane observes, will apply to no other epidemic whatever.*

How far the tanks or pools of water within the range of the febrile miasm, from whichsoever of the two sources produced, may become sufficiently impregnated to propagate the disease, has not been sufficiently determined. The Tamul, or native practitioners on the Coromandel coast, ascribe the epidemic that so often ravages their country to contaminated water as well as to contaminated air, and the able authors of the report on the Corimbatore fever incline to adopt this opinion.

In France, where, consistently with the popular doctrine of M. Broussais, the disease is supposed to be seated in the mucous texture of the stomach or intestines, and to be dependant on contagion alone,† as its means of propagation, a considerable degree of fancy has of late been indulged in, respecting the origin of this contagion; and the fancy has been varied according to the bent of the individual. Thus, M. Moreau de Jonnés has endeavoured to show, in a work of some learning, but more imagination (*Monographie Hist. et Méd. de la Fièvre Jaune des Antilles*, &c.), that the yellow fever, however at first produced, which has eluded his researches, has been perpetuated among Europeans, in the manner of plague, leprosy, and syphilis, by a specific poison that has existed immemorially among the Indians of St. Domingo, and was communicated by them to the Spanish fleet, under the command of Columbus, in December, 1493, and from this fleet to all the world in succession, in consequence of the close intercourse which took place between the individuals of the new settlement of Isabella, colonized out of the fleet, and the adjoining natives. In answer to which, however, it is sufficient to observe, after Dr. Chisholm, that the Spanish writers, Herrera and Oviedo, appealed to in proof of this fact, rather unite in showing, that the Spanish settlers received the disease, in the first instance, from marsh miasm, and then communicated it to the natives themselves: while M. Adouard traces the same contagious poison to an effusion or exhalation from the mucous membrane of the stomach of the indi-

* Future experience will decide, whether a fever, corresponding to that now adverted to, will ever arise in Ascension Island, except under circumstances similar to those stated by Sir Gilbert Blane. Fevers affecting the crew of a ship, however, may be looked upon as happening in a situation not the best adapted for ventilation, and where too many persons are congregated together; under these conditions, no doubt, any prevalent fever may become infectious. The state of the weather and atmosphere, and the localities, to whose influence the military were exposed in Ascension Island, about the period of their being taken ill, are particulars which should be studied in order to arrive at any very certain inference upon the subject.—Ed.

† This doctrine is on the decline in France, as already noticed in a previous page.—Ed.

vidual affected, produced by an engorged or congested state of its vessels, and which, in consequence of the gaseous elasticity of the material thus eliminated, escapes by eructation, and propagates itself by being swallowed, and thus communicated to the stomachs of others; on the mucous surface of which it commences a like action, and fructifies a like harvest of contagious matter; the black material which remains behind being, in his opinion, a mere caput mortuum, unendowed with any infectious or other mischievous property.—(*Relation Hist. et Méd. de la Fièvre Jaune, qui a régnée en* 1821, *à Barcélone*, 8vo., Paris, 1822.)

There is much truth in this last position, whatever becomes of all the rest. Black vomit has been by many physicians, and was at one time supposed by Dr. Rush, to be vitiated and discoloured bile; but it is now more generally conceived to be, as already stated, grumous or granular blood, let loose from the liver, stomach, or some other digestive organ, from the violent commotion of the disease.* Dr. Bancroft affirms that "it is always insipid;" and we have numerous instances of orderlies in sick rooms, who have had their hands and faces covered with black vomit suddenly ejected from the stomach, which they have taken little pains to wash off, while others have slept in sheets or blankets stained and inundated with its flow, and yet have escaped the complaint. It marks, indeed, the violence of the disease, and is hence, commonly, though not always, accompanied with the formation of contagious miasm, but in itself it is not a source of contagion. The following instance of disgusting hardihood, though it has been brought forward in proof, not only of the innocuousness of black vomit, but of the uncontagious nature of yellow fever from any source, falls rather within the limit of an exceptive idiosyncrasy, in the escape with which it was accompanied, than lays any foundation for a general rule. A. M. Guyon, of Fort Royal, Martinique, we are told in the Revue Médicale, had the bravery to wear, for twenty-four hours, the suit, drenched with sweat, of a soldier who had been labouring under this disease in its worst state; he suffered himself to be inoculated in both arms with the yellow matter issuing from suppurating blisters; he went into the bed of another patient, who had just died of the disease, while it was soiled with excrement; wore, at the same time, his shirt, soaked through with black sweat and still warm, and himself slept soundly, and sweated through a good part of six hours and a half, which he dedicated to this delectable trial; he exhibited several other feats of the same kind, and crowned the whole by drinking about two ounces of the black vomit discharged from the dead man's stomach—and, nevertheless, entirely escaped the fever. Admitting the truth of this marvellous story, there is still no great difficulty in conceiving that a man, who was so totally torpid to all delicacy of mental feeling, might, at the same time, labour under a like torpitude of corporeal feeling, and be insensible to various irritants that would be sure to affect others.*

It is probably owing to an idiosyncrasy, producing something of the same kind of insusceptibility to the action of the contagion of yellow fever, that while the miasmic poison for the most part takes place immediately, it sometimes continues dormant for an indeterminate period. Dr. Jackson has known it remain in this state for two months, and Dr. Bancroft for even nine or ten.

The individual who has passed through the disease, is rarely attacked a second time. In the opinion of some physicians, he obtains hereby an immunity at least equal to that afforded by the smallpox.—(*Report of the Army Medical Board on Dr. Pym's Observations.*) The examples, however, of recurrence are too numerous to justify such a comparison; though in most instances where the disease has returned, it has evinced a milder character. But this influence on the system, whatever it may amount to, seems to be lost by a short absence from tropical climates; so that those who return to Europe for a few months, are as open to all the effects of a febrile incursion, as though they had never been within the tropics before.

As the larger viscera suffer very differently in different cases of this malady, the appearances on dissection have generally kept pace with the previous indications: for, in some, the integuments of the brain, or even its vessels, its substance, and its cavities, have shown marks of inflammatory action, which have not been traced elsewhere; while in others, whose brain has appeared sound throughout, the stomach and its collatitious organs have been found chiefly affected with congestion, rupture, or, still more frequently, an erythematous inflammation, which, in some instances, has spread from the pylorus through nearly the entire range of the intestinal canal. In various other examinations, the chest has exhibited the chief seat of disorganization; and in others again, the urinary organs.† The mucous membrane of the intestinal canal is by far the most frequently injured organ; and this has been laid hold of with no small degree of triumph by M. Broussais and his adherents, as affording a manifest proof of the truth of their

* The effusion of blood into the cavity of the stomach or intestines, it is thought, may occasionally depend upon certain states of that fluid itself, by which it is so modified, that it tends everywhere to escape from the vessels. According to Andral, this is what happens in some examples of poisoning by absorption, and in typhus, and is the cause of the black vomit in yellow fever.—See Anat. Pathol., tom. ii., p. 151.—Ed.

* In the Med. Chir. Trans. of Edinb., vol. ii., Dr. Ralph has published the History of Yellow Fever, as it appeared in the queen's regiment in Barbadoes in 1816 and 1817. The facts mentioned by him, in proof of the disease not being communicable from one person to another, are remarkably strong; indeed, such as leave scarcely any doubt on the subject, as far as the particular fever described by him was concerned.—Ed.

† Bally, sur la Typhe Amérique ou Fièvre Jaune, Paris, 8vo.—Palloni, Obs. Méd. sur la Fièvre régnante à Livourne, &c.—Saverésy, de la Fièvre Jaune en général, &c.

favourite doctrine: and that yellow fever can be no other than *une* GASTRITE, or, in still later language, *une* GASTRO-ENTERITE. But it should not be forgotten, that most of the gastric symptoms, and all the severest ones, only occur in the course of the disease, and rarely in a very early part of it; and that they are hence rather to be regarded as effects of overwhelming febrile action upon the delicate and irritable texture of the membrane so severely excited, than as a proximate cause of the fever itself: and the more so, as sometimes the biliary system, the lungs, or the brain are chiefly affected, and the intestinal canal exhibits fewer proofs of suffering than any of these organs.

Unfortunately, the practitioners in warm climates have differed as much in their therapia as in their etiology; for the latter, as might be expected, has greatly influenced the former. Dr. Lind, Dr. Clark, and Dr. Balfour, whose authorities were implicitly allowed and submitted to, some fifteen or twenty years since, alarmed at the debility which the system will have to encounter in the second stage of the disease, or as soon as it has run through its inflammatory career, shuddered at the thought of the lancet, and generally commenced with clearing the stomach and intestinal tube by gentle emetics or purgatives, or both, and immediately had recourse to the bark in as large doses as the patient's stomach could bear, paying little or no regard to the remissions or exacerbations of the fever: though the last of these physicians chose calomel as his cathartic, and alternated its exhibition with the bark till the disease was subdued, or had effected its own triumph; at the same time allowing a free use of opium to keep the bark on the stomach, as well as to allay pain and procure rest; to which were occasionally added wine and brandy in considerable abundance, three bottles of the latter having sometimes been given to a patient in less than twenty-four hours, and the same proportion continued for several days (*M'Cabe, in Edin. Med. and Surg. Journ.*, Oct., 1819): while recourse was only had to the lancet, where there was obvious proof of very violent local affection.

The times, however, have since changed, and by far the more popular plan of late years has consisted in active, profuse, and repeated venesections, large and quickly renewed doses of calomel, cold affusion, gestation in pure air, and, as advised by some, the bolder exercise and rapid motion of a cart, spring-wagon, or any other carriage.—(*Hist. and Cure of Fever, by R. Jackson, M. D.*, part i., chap. xi., pp. 267, 270.) It was in this manner that Dr. Rush, regarding the inflammatory impetus as the sole cause of danger, boldly resolved to lay prostrate if possible the morbid Hercules at its birth, by bleeding, according to the state of the pulse, two or three times a day during the first two days, and by following up the same plan as long as a single germe of an inflammatory diathesis should continue manifest. "I paid no regard," says he, "to the dissolved state of the blood, when it appeared on the first or second day of the disorder, but repeated the bleedings afterward, in every case, when the pulse continued to indicate it. It was common to see sizy blood succeed that which was dissolved. The dissolved appearance of the blood I supposed to be the effect of a certain action of the bloodvessels upon it. The presence of petechiæ did not deter me from repeating bloodletting where the pulse retained its fullness or tension." And he affirms, that both petechiæ and vibices disappeared in various cases after bleeding. This plan he often pursued through the fifth and even the seventh day, in the course of which period, from a hundred to a hundred and twenty ounces of blood were frequently taken away by six or eight applications of the lancet.

His purgative plan was not less alert. Ten grains of calomel and fifteen of jalap, was the force with which he opened his remedial attack, and which he repeated every six hours, till the alvine canal was effectually evacuated. This mode of treatment, he tells us, he was led to by accident; and with it he became as successful as he had been unsuccessful under the tamer and more established method.

Under this plan of treatment, the venesection and the calomel were employed on a principle of depletion alone, and of diminishing a real or supposed increased action; and the former on the principle of a *gradual* depletion; Dr. Rush rarely venturing to withdraw more than sixteen ounces of blood at a time, though the venesection was as closely repeated as the patient's strength was conceived to be capable of bearing. Both these remedies have, however, still more lately been employed on different grounds, and under a different mode of management. Blood, instead of being taken away gradually and successively, has by many, and especially by Dr. Jackson, who seems to have introduced the practice, been drawn off, on the accession of the disease, to thirty or forty ounces at once, with a view of making a decisive impression upon the system; the same bold use of the lancet being repeated within three hours, if such impression be not effected: after which, "such powers are recommended as *stimulate* to a train of action, congenial to the action of health" (Op. cit., pp. 267, 293): and calomel, instead of being employed as a purgative, has been enlisted as a powerful alterant and deobstruent, and persevered in, to salivation, by doses of from five to five-and-twenty or thirty grains every third or fourth hour, according to circumstances, till this point is obtained; which, however, is not regarded as important in itself, but as showing that the system is sufficiently under its influence. Dr. Chisholm seems fairly entitled to the honour of having first tried and recommended mercury with this intention.—(Ibid.) "It ought," says he, "to be a general rule of practice to consider *all* remittent fevers, within the tropics, as symptomatic of local congestion, and inflammation. It is a rule, the observation of which can never be injurious,—almost always positively beneficial,—and the neglect of which is always productive of harm. Under this view, the judicious practitioner will consider the *tendency* to congestion as the object of his main

attention, and direct his efforts to prevent it. Upon the whole, then, the treatment is reduced to one sentence:—bleeding to the extent necessary, plentiful alvine evacuation, MERCURIAL PTYALISM, and cold affusion" (*On the Clim. and Dis. of Trop. Countries*, pp. 46, 47); and he adds, in another part of the same volume, (p. 215) "let it never be forgotten, that, at whatever period of the disease salivation is excited, whether the supposed signs of putrefaction have appeared or not, the accession of it is the certain signal of cessation of disease, and of returning health."

This general plan of Dr. Chisholm has in the present day become highly, and perhaps chiefly popular; and is powerfully recommended from personal experience of its advantage by Dr. James Johnson (Op. cit., pp. 50, 51, et passim), Sir William Burnett (*On the Bilious Remittent Fever of the Mediterranean*), Dr. Boyd (*De Febre Minorcæ*, &c., 1817), Dr. Denmark (*Medico-Chir. Trans.*, vol. vi.), and a long list of valuable authorities, who have practised in the one or the other of the Indies; all of whom, however, combine the use of calomel with copious bleeding; the former being regarded as the "sine qua non," or the "sheet-anchor," by some of them: and the latter being designated by the same terms, by others.

On a cursory glance, these diversified modes of treatment appear, in many respects, to be directly hostile to each other, and to establish an utter absence of any one therapeutic principle common to the whole; but a closer attention to the subject will show us, that there is not necessarily any opprobrium medicorum in the discrepance, except what results from becoming so exclusively the champion of any one of these respective modes of treatment as to bend every case to its own limits, and thus convert it into a bed of Procrustes: for there seems abundant reason for believing, that, in different situations, or under different circumstances, each of these plans has proved equally judicious and successful; since we have seen, that the disease, under different incidents and coadjuvants, has exhibited every variety of violence, and inclined to almost every variety of febrile type. Where there is not much impetuosity in the onset, no great derangement or prognostic of inflammatory congestion in the larger viscera, where the remissions are regular, and the epidemy is pretty uniform in its character, large and repeated bleedings, as a general rule, must prove mischievous. They will not shorten the career of the disease, but they will convert the remittent into a continued fever: and we shall in the latter stage of its course stand wofully in need of that strength which we shall have squandered away at first, if we have commenced with profuse venesection.

This is more especially the case where the disease makes its attack slowly and insidiously, assuming in some degree a typhous guise, as in the Guzzerat form, described by Mr. Gibson of the Bombay Medical Department (*Edin. Med. and Surg. Journ.*, vol. xi.): in which he tells us, that the debility is so great and instantaneous, as well as the tendency to putridity, that bleeding is never to be hazarded, except occasionally to the robust new-comer; and in which, even spontaneous hemorrhages, instead of proving critical, have always seemed to hasten death, and, indeed, without a single exception in his experience, to prove fatal. And it was probably from a survey composed largely of cases of this kind, though in the West Indies, that Dr. Hunter, in a tone still more generally proscriptive, and which will meet with few defenders at present, thought himself justified in affirming respecting venesection, that, even "in such cases as seemed most to require it—for example, where the patient was young, strong, of a full habit, and lately arrived from Europe—when the pulse was quick and full, the face flushed, with great heat and headache—and all these at the beginning of the fever—bleeding did no good."—(*On the Diseases of Jamaica*, p. 118, 3d edit.)

Dr. Pinckard, in his "Notes on the West Indies" (Vol. iii., letter xii., p. 134), has given a very interesting description of his own sufferings under this disease, and of the remedial process to which he had recourse. His attack commenced in the more common manner, slowly and insidiously, and demanded eight or nine days to reach its acme. His head, stomach, and at last his bowels, were severely affected, especially the first; but his intellect continued sound; and though the symptoms were vehement, there seems to have been little tendency to that violent visceral inflammation which in the stage of debility is so apt to produce gangrene; and consequently he had no black vomit. He lost twelve or fourteen ounces of blood at the commencement of the disease, and took a strong dose of calomel, which considerably relieved the pain in his head and eyes, and diminished the restlessness; but the thirst, heat, and dryness of the skin were still intense; and his weakness became extreme. Affusions of cold water, old hock, opium, and bark, were made use of in profusion, and each seemed to afford great relief. Yet, on the subsidence of the fever, he represents his feebleness as most deplorable. Here a freer use of the lancet could have been of no avail, and, had not the author most judiciously forbade its further employment, in all probability, he would never have been the historian of his own case.

On the contrary, if the disease make its incursion with great impetuosity; if the pulse be full and strong, or even if it be only hard, and there be great tendency to inflammatory congestion in any of the larger organs, as the head, the chest, or, as is far more common, the stomach, the spleen, and the liver, we cannot well be too bold both in bleeding and purging; and the plan laid down by Dr. Rush is by no means an exaggeration of what ought to be pursued. It may be, that eight-and-forty or even four-and-twenty hours are the whole we have to work in; and unless we can completely break down the inflammatory diathesis, the organs mostly affected will in all probability become gangrenous in a day or two, the oppressed bloodvessels will give way, and we shall have a chlo-

rotic or livid skin, cold extremities, black vomit, and all the other apparitors of death, before the tamer plan of aperients and diaphoretics could have time to produce the slightest impression on the system. Generally speaking, it will be best to bleed in an erect position, for the sensorial excitement, which is what we are chiefly to aim at, is best cut down by syncope, which an erect position will soonest induce; and we may hence save the expense of several subsequent bleedings.

Dr. Pym speaks with a very just discrimination upon this subject, in observing that, while the Bulam fever, or the disease in its most violent attack, is relieved by free venesection, the yellow fever, more properly so called from the brighter hue on the surface, or, in other words, that which is slighter in its incursion, will not often endure the lancet. Dr. Musgrave's statement seems to oppose this assertion, for he distinctly tells us, that "bloodletting in both forms is our sheet-anchor; the only pillar on which we can securely rest any hope of *extensive* success." The Antigua fever seems to have exhibited great severity in most instances, and hence called for a courageous course of practice with perhaps few exceptions. Yet the following paragraph proves that it did admit of exceptions, and softens down almost to unanimity a clash of opinion and practice which, after all, is more ostensible than real:—"We have repeatedly," says he, "with success, taken upwards of forty ounces of blood at one bleeding. With equal success we have in several cases renewed the bleeding up to the third, and even the fourth time; but generally speaking, those which require such reiterated evacuation evince an obstinacy NOT LIKELY TO ADMIT OF A FAVOURABLE RESULT UNDER ANY MODE OF TREATMENT. IT MUST ALSO BE REMEMBERED, THAT EVERY ONE WHO APPLIES FOR ASSISTANCE IS NOT ALIKE ABLE TO BEAR THIS LIBERAL DEPLETION." It only needs to be observed further, that the bowels were emptied, as they ought to be, by calomel or jalap, or some other active purgative; the head was shaven, and cold ablution preferred ordinarily to cold affusion, because of the fatigue endured under the latter. Bark was then instantly given, and, where the stomach would bear it, in the form of powder. Mercury, with a view of exciting salivation, was seldom tried, and not relied upon. In effect, in the milder cases it was not wanted for this purpose, and, in the more urgent, there was no time for its use.

There can be no doubt, however, of its being highly advantageous in a great multitude of cases, and of general benefit in various forms of this destructive epidemy. For, whether we contemplate the fever as local or unrestrained, as consisting in violent universal excitement, or, according to M. Broussais, in an inflammation of the mucous membrane of the stomach or duodenum irritating the bile-ducts, and the liver itself by sympathy; whether as threatening congestion to any of the larger organs, or actually accompanying congestion; there is no medicine which, *primâ facie*, affords a better prospect of relief than mercury, from its general action on the excernent system, as well as its specific action on the intestinal canal and the salivary glands. It must, however, be admitted that it is only under a particular condition and tone of the vascular frame that it can at any time be employed with good effect; and hence, not only is a sound judgment constantly demanded in its application, but much important time is often lost in preparing the system for its remedial introduction. In the case of ATONIC or strong vascular action, it is necessary, first of all, to lower, and, in the case of ATONIC or weak vascular action, to raise the living power to the proper standard before ptyalism can be obtained, which is the grand test of its having taken effect; and hence, to accomplish the former, bleeding, purgatives, and cold affusion, must be first called upon to exercise their respective powers, and, in the latter case, tonics and cordials; upon which last ground, Swediaur (*Nov. Nosol. Meth.*, Syst. i., 28) tells us that the most efficacious plan of treatment consists in giving calomel and columbo, in doses of *thirty-five* grains each, five or six times a day. It is truly said, indeed, by the advocates for mercury, that such other remedies are all valuable adjuvants; and this is so far from being denied by those who are hostile to the use of mercury, that they affirm, on the contrary, that the benefit ascribed to this medicine, when it has once obtained a sway over the system, ought rather to be attributed to these adjuvants themselves, which would have proved still more beneficial had they been left to their own power and intention alone. Mr. Gibson, who is a strenuous advocate for the use of mercury upon the principle now adverted to, very candidly admits both these causes of impediment. "In hotter climates," says he, alluding to the debilitating province of Guzzerat, "the PHLOGISTIC state of the system is adverse to the introduction of mercury: but the prudent abstraction of blood happily reduces it to that standard which is most favourable for its action. In India, however, in fever, the disease in which this is *most speedily* to be desired, the same means would but in very few cases be admissible: for the DEBILITY IS SO GREAT and instantaneous, as well as the tendency to putridity, that only in the robust new-comer is it, if ever, to be hazarded. It would seem that DEBILITY AND THE PLETHORIC SYSTEM ARE EQUALLY INIMICAL TO THE SPECIFIC MERCURIAL ACTION. If the patient is fortunately invigorated sufficiently to give the mercury influence, and BEFORE ANY ORGAN ESSENTIAL TO LIFE IS INJURED, by the strictest nursing and attention afterward, the recovery is almost certain, all morbid action yielding from the moment ptyalism is brought on."—(*Edin. Med. and Surg. Journ.*, vol. xi.)

Even in cases, however, in which the mercurial action is fortunately excited, the same intelligent writer tells us that he has frequently met with a very serious evil resulting from the mercury itself; for such, says he, is at times the profusion of the ptyalism, when once induced, that the most disagreeable consequences succeed, and the convalescence is long and preca-

rious; on which account he laments that we have no criterion to determine how far we may proceed with the mercurial process, and when we ought to stop. Dr. Bancroft advances much further than this, and asserts that not only has the salivation retarded the convalescence, and produced very troublesome affections of the tongue, mouth, and throat, with other ill consequences thus acknowledged by its advocates, but that the salivators, even when they have been free from these evils, have not been more successful than other practitioners; and he particularly alludes to the admission of Dr. Rush, who was not unfriendly to the mercurial mode of treatment, that, "in the City Hospital (of Philadelphia), when bleeding was sparingly used, and the physicians depended chiefly upon salivation, MORE THAN ONE HALF DIED of all the patients who were admitted."—(*Essay on the Disease called Yellow Fever*, &c., Philadelphia, 8vo., 1811.) For like reasons, Dr. Jackson speaks with as little satisfaction of the same practice, not only upon his own experience, but even upon that of Dr. Chisholm himself. Alluding to the high recommendation of mercury by the latter, he observes, "the detail of his testimonies does not warrant a conclusion so favourable; for the proportion of mortality in the detachment of Royal Artillery, upon whom this practice is supposed to have been first tried, has perhaps scarcely ever been exceeded in a tropical climate. Further, it is a common observation, that, where salivation actually takes place in continued fevers, it seldom shows itself till the violence of the symptoms has evidently abated: hence, a suggestion arises that the appearance of salivation is only an indication of the departure of the disease—no proof exists that the operation of the mercury is the cause of this departure. Such are the remarks which occurred in reviewing different modes of treatment in the hospitals of St. Domingo; to which it will not be superfluous to add an experiment made at the Mole in August, 1796, by Mr. Lind, Surgeon of Jamaica. Out of fifteen cases of fever put under the care of Mr. Lind, on *the first day* of the disease, and treated with the utmost attention, five died; in three of whom, salivation actually took place; five recovered, in whom no salivation took place; in the other five, who also recovered, salivation was evidently established; but, as is usual, not till the violence of the symptoms had begun to abate. Out of four who were put under his care on *the second day* of the disease, no one died; but one only was affected by the mercury; one, brought to the hospital on *the third day* of the illness, died: mercury was employed, but no salivation took place; one, on *the fourth*, likewise died, without marks of salivation; one, on *the fifth*—the salivation was established, but the disease proved fatal. In none of the above cases were less than ten drachms, and in most not less than two ounces of strong mercurial ointment rubbed into the legs and thighs, with the employment of all other means which seemed calculated to promote the expected effect."—(*History and Cure of Fever*, part i., ch. xi., pp. 293, 294.)

The question, therefore, to say the least of it, is still open; and, admitting all that can be said in favour of employing mercury as a sialagogue, the evils which flow from the uncertainty of its action, both in respect to time and degree, and its frequent inroads upon the constitution, even where it has been of use, are serious and important.

On the employment of EMETICS, there is now no longer any question. It is admitted, on all hands, that, in the irritability of the stomach and its collateral organs during this disease, they are generally improper, and almost constantly augment the morbid action; on which account, even the antimonial sudorifics are of very doubtful efficacy, and, whenever ventured upon, should be combined with opium. And, for the same reason, the use of carriage exercise, so strongly recommended by Dr. Jackson, and some of the most distinguished American practitioners, even "under the inconveniences of a scorching sun, of clouds of dust, and of a jolting cart" (Ut suprà, p. 287), has rarely been put to the test, except in the emergency of the sudden retreat of an army: and has hardly been allowed to enter into the catalogue of ordinary remedies.

The general treatment, indeed, may be summed up in few words. Copious bleeding, a free repetition of active purgatives, combined with opium where the ventricular irritation is considerable, in the commencement of the fever; frequent sponging, or affusion of cold water, with an interposition of the neutralized salts as diaphoretics, during its progress; and bark and other tonics, as soon as the febrile commotion begins to subside. The more powerful and violent remedies of repeated bleedings to faintness, mercurial salivation, or the stimulants of spirits, ether, and opium, being alone added to the list, according to the circumstances of the individual case.

Pure air, by a ventilation of the atmosphere, is, however, a more powerful remedial agent than all the rest put together; and to this position I apprehend every class of writers will accede, how much soever they may differ upon other points. The Army Medical Board is, therefore, peculiarly entitled to the gratitude of the country for the great pains it has taken to give improvement to this important object, by an establishment of open and wide-spreading encampments, instead of confined and unperflated barracks; and no man can hear of the desirable success with which this enlightened measure has been attended without exultation. The attempt, as I am permitted to state from the manuscript documents in the possession of the Board, has been made at Barbadoes, Tobago, and Antigua; not more than four individuals being allowed to occupy a single tent, instead of ten or twelve, which is the usual proportion at home: and the success developed in these islands has already become so considerable and decisive, that government has consented that a like trial should be made in all the islands around them. In the affected crew of the Pyramus, distributed by Dr. Hartley into an encampment

at Antigua, in the year 1822, not a single case of fever was found to travel from one individual to another. We cannot wonder, therefore, at beholding this able officer anxious, in his report for 1823, that the same plan should be extended to other places, and adopted in other diseases. "In cases of sickness," says he, "and especially in yellow fever, I feel convinced in my own mind, that nothing could prove so beneficial in checking the ravages of this disease, as separating the troops; and particularly by removing them to some distant dry field from the locality of the attack. Nothing could more immediately substantiate the advantages of removing and encamping a body of men, than the result in the Pyramus's crew."

In Barbadoes, where, as I have just observed, the same improvement has obtained a footing, the mortality for the last two years is almost incredibly abated. I have examined the tables subjoined to the annual reports in the office of the Army Medical Board, and have found that, from having been upon an average of seven years, about one in twenty-one of the sick list, in 1822, the mortality was only one in twenty-four; and, in 1823, only one in thirty-five. In this last year, however, it should be observed, that the hospital list was somewhat enlarged by the occurrence of an influenza unaccompanied with much danger; yet the aggregate of patients amounted to not more than about a hundred beyond those of the preceding year. I am ready to allow, that several other important regulations, for which we are equally indebted to the vigilance and the judgment of the Army Medical Board, may have contributed to this salutary change; but the greater part of it is still, perhaps, to be ascribed to the new plan of encamping. I cannot give a better description of the adjuvant regulations I am now referring to, than by adopting the words of Mr. Tegart, an enlightened inspector of hospitals at Barbadoes, who, in his manuscript report for 1823, thus enumerates them, and at the same time confirms the ameliorated health of the soldiers quartered in that station, and to which I have just referred. "The loss in that year," alluding to 1822, or the preceding, "was so comparatively small with former ones, that I hardly hoped to send so favourable a one again. This return, however, exceeds greatly any hopes I could have anticipated; being not one half the average amount of the preceding six years; and not a sixth part of the yearly loss sustained in the fourteen years antecedent to those. There are many reasons for this favourable change: the men are better clothed, better fed, and better looked after by their officers; there are many local improvements in the vicinity of the barracks, which formerly were not much attended to: such as draining swampy and marsh ground; clearing away brushwood and long grass, which harboured moisture, and emitted, at certain seasons, noxious exhalations, producing fever and other diseases, the treatment of which was very different from that of the present day. I believe most sincerely, that we are also indebted for the favourable comparison in the scale of mortality to the improved education of medical men, to the discoveries in the various branches of medical science, and to the rationale of medical practice."*

The writer of this work cannot avoid adding his

* Under the head of epanetus malignus, Dr. Good has described several forms of fever, which by some clinical writers have been deemed to possess characteristics sufficiently dissimilar to justify a different classification. It is not the province of the editor, however, at any time to interfere with the material arrangement of the book, and more particularly in this instance, as the non-prevalence of epanetus malignus flavus in the northern and middle sections of the United States in latter years, has prevented him from observing its nature. He will therefore merely add a few remarks derived from the writings of American authors, who have had ample experience with yellow fever, and whose productions, if they had been within reach of Dr. Good, would doubtless have been mentioned in these pages.

Many American physicians richly deserve a noble reward for their efforts to alleviate public calamity, by their various expositions on the vexed subject of contagion and infection in febrile disorders, and particularly in relation to the malignant yellow fever, as it has occasionally appeared in different parts of our country.

Disclaiming to espouse with implicit confidence the theoretical views of any writers on the Bulam, the malignant, the pestilential, the yellow, or the bilious remittent fever, or to vouch for the accuracy of even our most ingenious native authors, the editor will only refer to some particular sources of information, which should be examined by those desirous of a more extensive and better knowledge o. "ellow fever than is to be found in the text.

For additional information in respect to the early appearance of yellow fever, besides the sources already referred to, the reader may consult Hughes' Hist. of Barbadoes, and Towne on Yellow Fever. Dr. Moseley's work on Tropical Diseases contains an able article on the West India Ardent Fever, which he terms the causus of Hippocrates, in which opinion he is followed by some American authors. An excellent tract on the West India Disorder, is that by Dr. Fowle on the Ardent Fever, and the same is true of the treatise by Dr. Warren, on the Disease at Barbadoes. The well-known paper on Yellow Fever by Dr. Lining, of Charleston, S. C., in the Edin. Lit. and Phil. Essays, and the remarks on the same subject in the History of South Carolina, by the late American historian, Dr. Ramsay, should also command attention. Dr. Rush's several histories of the Yellow Fever, as it has prevailed in the United States, will be found replete with valuable information.—(See his Med. Obs. and Inq., 4 vols., 8vo.) Dr. Samuel Brown published an essay on the Yellow Fever of Boston, in 1800. Dr. Colden's account of the Yellow Fever of New-York, in 1741–2; Dr. Bayley's remarks on the same disease, as it appeared in New-York in 1795; Dr. John Mitchell's description of the same in Virginia (see Francis and Hosack's Amer. Med. and Phil. Register), and the talented essays of the late Dr. Edward Miller (Med. Writings, New-York, 1814), may be consulted with profit. Professor Potter, of Baltimore, has traced the history of yellow fever from 1607 to 1822. But with the exception of Dr. Rush, no American has written so repeatedly and so largely on this pestilence as Dr. Hosack of New-York. He earnestly contends for its foreign origin, its specific character, and its contagious nature under

conscientious assent to the correctness of these views.*

There is another variety of malignant remittent, which has been known to medical practitioners from the time of the Greeks, though less frequent than the yellow fever, and which, by Hippocrates, has been denominated CAUSUS; as it has by later writers, who have only translated the Greek term, been called FEBRIS ARDENS, ARDENT OR BURNING REMITTENT. From its being usually accompanied with much disturbance of the stomach and intestines, it is called by Professor Frank, *febris gastrico-inflammatoria*, as the last variety is *febris gastrico-nervosa*. In Hippocrates, it is briefly described as a fever, characterized by extreme heat, violent thirst, a rough and black tongue, complexion inclined to yellowish, saliva bilious. There is commonly an acute aching in the head, nausea, great anxiety of the præcordia, with frequently a gnawing pain at the stomach. The bowels are unusually costive, particularly at the commencement of the disease. The tongue, mouth, nostrils, and, indeed, the whole surface of the body, are parched, and fiery-hot, whence, indeed, the Greek name for the disease; the pulse is full and strong; the voice hoarse; the breathing short and quick, with sometimes a slight cough, and occasionally delirium.

It chiefly attacks the young and the vigorous, who bear the attack better than old persons. The causes to which it was formerly ascribed are, long exposure to the heat of the sun, great fatigue from undue exercise or labour, or too heating a diet. It has of late, however, been supposed, and with much plausibility, from its frequent occurrence towards the autumnal equinox, and especially from its resemblance to the yellow fever, that, like the latter, its ordinary remote cause is the miasm of swamps and marshes. And if so, it affords us a proof that, under certain modifications, febrile miasm issuing from this source may, as I have already suggested, produce a caumatic or inflammatory, as well as a synochous or typhous tendency, in constitutions predisposed to this character of fever;* for the causus is, in fact, whatever be its cause, a vehement inflammatory remittent. It is on this account, that Dr. Mosely conceived the causus of the ancients, and the yellow fever of the present day, to be one and the same disease; whence he applies to the latter the Greek name of causus. This, however, is not quite correct: for in the real causus, the burning heat is more intense, the thirst more intolerable; while the stomach is generally less irritable, and will bear vomiting with advantage: and, in the second stage, the chilliness which, in the yellow fever, is merely accompanied with horripilation, and is a mischievous symptom, in the causus is accompanied with a smart rigour, which often terminates in a copious and salutary sweat. The process, moreover, in the causus, generally lasts only four days, and is

certain circumstances.—(See his Medical Essays, 3 vols., 8vo., New-York, 1824.) Professor Caldwell, of the University of Transylvania, in his appendix to Alibert on Intermittents, has given an account of the yellow fever in Philadelphia, and many valuable articles on the same subject may be found in the Facts and Observations of the College of Physicians at Philadelphia, and in Additional Facts; also in the Philadelphia Medical Museum of Dr. Coxe, and the Philad. Medical Recorder. Papers on the yellow fever have been published also in the Med. and Phil. Register, edited by Drs. Hosack and Francis, in the New-York Med. Repository of Drs. Miller, Mitchell, and others, and the New-York Med. and Phys. Journal, edited by Drs. Francis, Beck, and Dyckman. The peculiarity of the immunity of the constitution from a second attack of yellow fever was first noticed by Dr. Pym, of London, in 1815, and in June, 1816, Dr. J. W. Francis called the attention of American practitioners to this fact, in a letter dated at London.—(See New-York Med. and Phys. Journal, vol. i.) The reappearance of the yellow fever in New-York in 1822, renewed with much ardour the controversy concerning its contagious character, and a volume of much research, maintaining its specific nature and contagiousness, was published by Dr. Townsend, New-York, 1822. The publications of Mr. Hardie should also be consulted. He has written distinct histories of the disease, as it invaded New-York in 1795–8, 1803–5, and 1822. Other papers on the disease, as it has appeared in the southern and southwestern states, may be found in the different volumes of the Am. Journ. of Med. Sci., in the Transylvania Journ., &c.

The pathology of yellow fever has been advanced by Dr. Physic's account of the results of post mortem examinations, made in 1793; from them, he concludes, that this disease is attended with a high degree of inflammation of the stomach. Dr. Cothrell's analysis of the black vomit may be found in the Trans. of the Am. Phil. Soc., vol. v.

Perhaps no writer has described the pathognomonic signs of yellow fever as distinct from bilious remittent fever, with more philosophical acuteness than Sir Gilbert Blane in his work on the Diseases of Seamen; and some of our ablest writers, who in their views of yellow fever have confounded diseases of different origins, might consult his work with singular profit.

It has justly been remarked, that some forms of bilious remittent fever occurring in the interior of our country, viz., those of great violence and of short duration, resemble the yellow fever very much; hence the unity of these two forms of disease has been maintained. A paper, pointing out the pernicious tendency of this too hasty generalization, drawn up by Dr. Norcom, of North Carolina, may be found in Hosack and Francis's Am. Med. and Phil. Reg., vol. i., p. 17; it throws light on an intricate subject, and is worthy of a close perusal.—D.

* Our author has not spoken of the proposal to cut short the disease by the administration of bark, arsenic, or other antiperiodic remedies, as in intermittent fever. Now, with reference to this suggestion, Dr. Joseph Brown very judiciously observes, that, in order for it to be tried with safety, the remission must be so perfect as to amount to an actual apyrexia, and the disease would then be identified with intermittent fever; and he has almost uniformly noticed, that the employment of any antiperiodic in truly remittent fevers not only failed, but invested the disease with a more continued and dangerous character.—Cyclop. of Pract. Med., art. FEVER.—ED.

* Devèze, Traité de la Fièvre Jaune, 8vo., Paris, 1820. Saverésy, De la Fièvre Jaune en générale, et particulièrement de celle qui a regnée à la Martinique en l'an 1803–4.

terminated, when left to itself, by a critical diaphoresis, vomiting, diarrhœa, or nasal hemorrhage; but if the fever be not carried off in this way, it commonly becomes fatal.

We have, nevertheless, satisfactory proofs, that though the causus and yellow fever be not the same disease, both often issue from the same febrile miasm, and sometimes run their race conjointly; the difference depending chiefly upon the idiosyncrasy, or the peculiar condition of the constitution at the time of attack.

Thus, in that most formidable assault of yellow fever which took place at the Mole in St. Domingo, in the autumn of 1796, Dr. Jackson tells us, that "the symptoms of the disease, among a set of men vigorous by nature, and often transgressing the rules of temperance, were *ardent* and *violent*, with much vascular excitement in the early periods, often subsiding on the third day, and terminating rapidly in black vomiting, and a formidable train of horrors."—(Op. cit., p. 66.) And he has since met with the same form in Spain, which, in effect, constitutes his first division of the Andalusian fever.—(*Remarks on the Epidemic Yellow Fever on the South Coast of Spain*, London, 8vo., 1821.) And, hence, Dr. Chisholm informs us, that "the diseases which originally proceed from marsh exhalations, may be so impressed with the action of irregular temperature as to render them *highly inflammatory*, although the character and nature of the original are so manifest, as to make a mode of treatment suitable to the two diatheses, or rather the mixed diathesis, prevailing in the system, necessary." And, in proof of his remark, he has quoted several instances from the Report of the Army Medical Board, of which that which occurred in the year 1812, at Brimstone Hill, St. Christopher's, is probably most worthy of notice, on account of the topography and general healthiness of the spot, which is described as follows:—

"Situation, N. Lat. 17°—soil light and dry—composition, rock and sand—elevation, six hundred feet—distance from the sea, a quarter of a mile. Barracks exposed to currents of air and strong winds, directed on them by ravines. No swamps in the neighbourhood. Change of temperature sudden, from 70° to 80° and 90° in the course of a few hours. Rain abundant. Probable cause, previous hot dry weather, ill-ventilated and ill-constructed barracks, some of them bomb-proof. Epidemic cause unknown; and prevalence of the disease cannot be accounted for."

The cause, however, is not difficult to assign; and, in truth, we have already adverted to it in describing the occasional origin of yellow fever: for, however dry and elevated the situation may be, yet, on the descent of copious and continued rains, such as are here set down, a temporary swamp is very soon produced, and of sufficient power, in hot climates, to generate, even "on a light and dry soil, and a sandy rock," febrile miasm enough for the severest epidemic; and especially where such miasm receives the collateral aid of ill-ventilated barracks, and currents of cold air blowing down long ravines directly upon the troops while in a state of perspiration; and producing a sudden abstraction of animal heat, more mischievous, perhaps, within the tropics, than on the banks of the Copper-mine river during the snows of the winter season, where, as Captain Franklin informs us, the Chippewayan Indians find them the most detrimental and destructive to life of all the numerous and heavy evils to which they are exposed.—(*Nar. of a Journey to the Shores of the Polar Sea*, &c., p. 249, Lond., 4to., 1823.)

The fever continued through the winter, evidently in this case kept up by its having become contagious. It was at first confined to one of the barracks occupied by a company of the 25th regiment; and its symptoms are thus briefly but forcibly described:—"Type continued:—thirty-four admissions from this company alone: symptoms, in all, of a most unfavourable character from the first attack; great headache, sickness, and vomiting; pulse full and hard; eyes inflamed; face flushed; ardent heat of the skin; in many cases yellowness of the whole body on the second day of the disease. The entire number of cases was four hundred and twenty-two: of which not fewer than one hundred and eighteen died, affording a mortality that treads close upon the heels of that in the plague."

In the treatment of this variety, the advocates for copious bleeding and for free doses of calomel may shake hands; for both may be allowed with liberality. The calomel, however, is found most successful when combined with antimonials or Dover's powder. Free purging is also to be strongly recommended; the means, in effect, whatever they are, must be vigorous to be of any avail: for the disease itself is of great vigour and rapidity; and, unless prostrated at the onset, will soon prostrate the patient. In conjunction with this process, we may also adopt that of Hippocrates, who, in the burning remittent of his own day, employed cold applications in every way: the coldest possible drinks; and the coldest possible clysters, and ablution with cold water applied to every part of the body.—(Περι Παθων, p. 518, lib. 48, 51, p. 419, lib. 37.) Under proper regulations, there is no doubt of the advantage of such a treatment; and the medical process of the continent, as well as that of our own country, throngs with cases in which it has been found serviceable. Marquet recommends (*Observations sur la Guérison de plusieurs Maladies*) the application of cold air as well as of cold water; and gives an instance of a rapid cure in one who, in a state of delirium, exposed himself naked to the cold of the atmosphere out of doors. And on this account Schäffer advises (*Versüche*, i., p. 164), that the patient, in any acute fever accompanied with dry burning heat, should be carried forth from his chamber on a mattress, and thoroughly ventilated abroad. Dr. Jackson would indeed have him ventilated in any way, even on a cart or wagon, if there be no easier conveyance.

In the preceding varieties, the malignant remittent has shown a tendency to an inflammatory or a synochous career. Under particular circumstances, however, it evinces a like incli-

nation to a deep nervous depression, sensorial debility, or a TYPHOUS CHARACTER from the first. And this, whether the febrile miasm originate from a decomposition of marsh or of human effluvium; for the records of medicine furnish us with innumerable instances of both. In the two cases, however, there are a few slight variations in the range and mode of its action, the laws of which I have already endeavoured to lay down as far as we are acquainted with them (p. 343); and hence M. Bally, confounding this variety with proper yellow fever, calls the latter the *American typhus*, and makes two divisions of it, a contagious and an uncontagious, according to its degree of violence.—(*Sur le Typhus d'Amérique, ou Fièvre Jaune*, &c., Paris, 8vo.) This modification of the disease, therefore, is best distinguished by the name of ASTHENIC REMITTENT.

The epidemics of this kind, accompanied with most mortality, are those which arise from a decomposition of human effluvium in the midst of filth, poverty, or famine, great heat and moisture, crowded multitudes, and a stagnant atmosphere: for here we have almost all the auxiliaries of febrile miasm operating for its production. The remittent epidemics of Cadiz and Malaga seem chiefly to have been of this kind; and they are the common pestilences of dispirited armies, maintaining their ground with difficulty in the midst of great carnage, surrounded by the dead and the dying, reduced to short provisions, and worn out by the fatigues of the campaign. The writings of Sir John Pringle are full of examples of this kind: and Professor de Haen has given a striking description of the same in his account of the contagious epidemy that committed such tremendous havoc throughout the Prussian army, at Breslaw and its vicinity, in the middle of the last century, constituting the disease to which M. de Sauvages has given the name of Tritæophya Vratislaviensis. It was peculiarly distinguished by irregular action, great debility, and overwhelming dejection of mind. The lipyria, or coldness of the surface, with which the disease opened, rarely yielded to any general reaction, for the extremities seldom became warm, and were often rigid and convulsive; at the same time that the interior parts burned like a fire; the head and stomach suffered with acute pain; there was great anxiety about the præcordia; and so exquisite a soreness over the entire surface, that the patient had the greatest dread of being exposed to the contact of the external air, a mere change of the temperature being intolerable. De Haen himself at length became a prey to the infection, and his attack commenced as thus far stated. On the fourth day, he tells us, all his symptoms were worse, his feet quite chilled, but his hands red, and agitated with convulsive motions; he had occasional vomitings, and was terrified with the image of impending death. On the eighth day the pulse was convulsive, and he was continually crying out from his pains. On the ninth, delirium, and a rejection of grumous blood from the stomach. On the eleventh, perspiration and a tranquil pulse, but the voice was broken, the speech was interrupted, and the teeth grated. On the twelfth, the jaw was convulsed, there was a sardonic laugh and deafness. On the fourteenth, an icy coldness covered the whole body, accompanied with a cold sweat, but a frequent use of ablutions afforded relief. On the eighteenth, he had a vivid delirium, but fainted on being taken out of bed; which was succeeded by hunger, copious sweats, and profound sleep, with an intolerance of noise. At this time, every thing appeared new and extraordinary; a feeling described by many sufferers as soon as the violence of the disease begins to abate, and which Dr. Pinckard has very strikingly noticed in his own case. The symptoms varied considerably from this period, and he had still many dangers to contend with. He recovered, however, though very slowly, and with numerous drawbacks; for, on the thirty-sixth day, he had a cholera, and on the forty-eighth, his skin scaled off and he lost his nails.

Towards the close of the disease, the skin was covered with a scabid or ichorous eruption, rather than petechiæ; evidently from debility of the capillaries: a fact that has often occurred even in the slighter attacks of this variety of remittent in our own country, when it has occasionally broken out, as in 1765, among the troops stationed in the vicinity of Portsmouth, and is particularly noticed by Dr. Lind. In this last case, it was often suspected to be the itch, to which it had a very near resemblance: and it is highly probable that, in many instances, it was so, and that the *acarus scabiei* found, in the sores, a convenient nidus for the deposite of its eggs.

There are situations, however, in which the febrile miasm, producing this low variety of remittent, is generated by a decomposition of the stagnant matter of humid marsh-lands; such chiefly are the regions about Cape Coast, in Africa, especially when visited by the foul and smouldering harmattan, and about Gombrow, or, as Sir John Chardin calls it, Bander-Abassi, on the Gulf of Persia (*Voyage du Chevalier Chardin*, &c., tom. ix., p. 511–518): in which last place the mortality is so severe between the months of April and September, that the deaths are ordinarily calculated at nine out of ten of the inhabitants, and this notwithstanding that most of them retire during such period towards the mountains, and all mercantile concerns are relinquished; so that, says the chevalier, "la moisson est fermée, comme un parle." The diseased are commonly removed higher up the country as soon as they sicken; but, whether removed or not, they usually die in four or five days.

There can be no doubt, that, in both these places, the danger of the disease may be augmented by the dense and stinking vapour that is perpetually blowing upon them during the pestilential season, the "puantes vapeurs de la mer," as Sir John expresses himself, "qui font bondir le cœur la première fois qu'on les sent." These, on the African coast, are impregnated from the impenetrable mangrove swamps of the

interior of Guinea, and on the Persian, from the saline and sulphurous exhalations of the several adjoining islands, which the winds of the season pass over in their periodical sweep; and the copious disengagement of hydrogen, whose presence the intolerable stench seems to indicate, will account in no small degree for the deficiency of living power, which so peculiarly distinguishes the malignant remittent in these quarters. In the latter region, indeed, some such debilitating influence seems to operate habitually: for the ingenious author thus quoted adds, that "the nations carry in their complexion and constitution the proofs of their malignant atmosphere, being yellow and ghastly from the age of twenty-one, and decrepit at thirty." Of the destructive power of such vapours, we have sufficient proof from what occurs on the coast of Batavia, and the islands that immediately surround it: for if, by judicious treatment, a patient in this quarter should become convalescent from an attack of yellow fever, he is still almost certain of falling a prey to the disinvigorating and deliquescent influence of the noisome exhalation by which he is surrounded, and especially between sunset and sunrise, unless timely removed to a more salubrious quarter.

We may hence readily conceive how yellow fever may, under certain circumstances, have a strong tendency to the same asthenic character, and run rapidly into a typhous form, or be combined with its symptoms from the first.

This is, in truth, the hybrid disease of Sir Gilbert Blane, Dr. Lemprière, and Dr. Dickson. "In certain seasons," says Dr. Jackson (Op. cit., 277), "in certain situations, and in certain periods of the year, the character of the ENDEMIC is insidious and *malignant*. The disease under those circumstances often begins regularly as a single tertian; and two, and sometimes three revolutions pass over without giving any alarm to ordinary observers: but at one or other of the above periods, a paroxysm commences with coma, stupor, and suspension of functions, threatening immediate destruction: or, as often happens, the energy of action becomes less and less distinct in every succeeding paroxysm; the skin becomes dry, or damp and greasy, the powers of life are overwhelmed, the pulse contracts itself, or becomes apparently weaker and weaker under the use of bark, wine, and the strongest stimulants of the materia medica." His second form of the Andalusian fever of 1820, is precisely to the same effect.—(*Remarks on the Epidemic*, &c., *on the South Coasts of Spain*, 1821.)

It is to this variety of the endemic of intertropical regions, that Dr. Chisholm has given the name of *malignant pestilential fever*. "It must be kept in mind," says he (Op. cit., p. 167), "that this, the most tremendous of all the tropical diseases, wherever it appears, is the typhus of Europe, grafted on the yellow remittent fever of the torrid zone, or of countries whose climate, during part of summer and autumn, possesses the temperature of the torrid zone."—"It is evident," says he in another place (p. 43), "that typhous infection does exist, perhaps does originate, within the tropics. How fraught with mischief, therefore, is that theoretical notion, that such infection cannot exist, cannot originate, and cannot be propagated in hot climates. Let the young and unexperienced practitioner guard himself against it, and be prepared for it when he meets it."

Dr. Chisholm offers a variety of examples in proof of this assertion, to several of which he had been an eyewitness, especially to that which is so well known to have broken out in the unfortunate attempt to colonize the Island of Bulam, in the spring of 1793, and which gave rise to the fever of this name, so strikingly characterized by its asthenic signs. He has noticed others also, of nearly equal demonstration, extracted from the reports communicated to the Army Medical Board of our own country. But, perhaps, none offer more striking proofs of this peculiar type than the Edam remittent of 1800, described by Mr. Shields, and that of Trinidad of 1819, described by Dr. M'Cabe.—(*Edin. Med. and Surg. Journ.*, Oct., 1819.) In the former of these, the marks of an extreme debility were often peculiarly impressive from the first. The patient, with little previous notice, was seized with giddiness and cold chills, great sense of weakness, pain over the orbits and in the epigastrium, together with vomiting. He frequently fell down and was insensible during the paroxysm, his body covered with a cold clammy sweat, except the pit of the stomach, which always felt hot to the palm of the hand; the pulse was small and quick; great torpor in the intestinal canal; the pupil dilated and incontractile; great despondency at first, then low delirium or insensibility to danger. The patients, while on the island, were carried off in eighteen, twenty-four, thirty, or forty hours: though often, when removed, not till after as many days. So malignant, indeed, was this pestilence, that "almost every one who slept on the island a single night died." The organs chiefly affected were first the brain, and in succession the stomach and liver. In the Trinidad remittent, so reduced was the vital energy, that it was found necessary, in various instances, to give the patient three bottles of brandy in less than twenty-four hours, and to continue this proportion for several days.

The treatment has here varied as much as in yellow fever; in truth, it ought to vary—not, indeed, according to preconceived and general hypotheses, whose only variance consists in fighting general rules against general rules, but in modifying the plan, whatever it may consist in, to the peculiar case.

Bleeding, however, must never form a part of the general practice, how necessary soever it may be in particular instances where atonic congestion may oppress the head or any other large organ. And even in such instances, it will generally be found more expedient to employ calomel in large and repeated doses, than the lancet, unless we see the patient at the very opening of the disease. Under either practice, the bowels must be opened, and kept open by active purgatives; since, from the

general disturbance of the functionary balance, there is violent action in the abdominal viscera, while the vessels on the surface are entirely torpid. To restore this balance should be our uniform effort: and hence, in conjunction with the above, nothing bids fairer, or has in fact been found more successful, than the use of warm diaphoretics with opium. Cold water as a beverage, or in the form of injection, has also proved a highly refreshing tonic; frequent potations of old hock still more so. The bark is a doubtful remedy, for it often sits uneasy on the stomach, and is rejected. It has hence fallen into undeserved disrepute. When, however, it harmonizes with the stomach, and is retained without oppression, it is entitled to all the praise that has been bestowed on it by former writers, and cannot be given too freely. The best preparation of it for the present purpose is undoubtedly the sulphate of quinine. Ablution with cold water has been tried very generally during the malignant remittents of most climates, and always with very great advantage.—(*Epidemia verna quæ Wratislaviam*, anno 1737, afflixit. Vide *Act. Nat. Curios.*, tom. x.)

SPECIES III.

EPANETUS HECTICA.

HECTIC FEVER.

PULSE WEAK; STAGES OF CHILLINESS, HEAT AND SWEAT VARIOUSLY INTERMIXED, AND SOMETIMES SINGLE; COLD STAGE EXHAUSTING; EXACERBATION CHIEFLY IN THE EVENING.

THE symptoms of this species, except in its sweating stages, are far less violent, and consequently its duration is far longer, than that of either of the preceding. Nothing, however, can more fully prove its complexity and irregularity, than the different characters given of it, and the different places allotted to it by different authors. Sauvages and Sagar introduce it into the list of continued fevers: Linnæus, Crichton, and Parr, into the present division, or that of remitting and exacerbating fevers: Boerhaave regards it as of a mixed nature, a continued intermittent. "Febris hectica," says he, "est referenda ad febres continuatas intermittentes." Vogel and Cullen degrade it into a mere symptomatic affection. "As I have never," says the latter, "observed a fever of this kind except when symptomatic, I could not consent to admit it into the list of idiopathic fevers, which alone ought to be enumerated."

Those who have adopted Dr. Cullen's opinion, have usually contemplated it as a mere effect of absorbed pus. Dr. Heberden seems to think it dependant upon a local cause, but that irritability in any diseased organ, which cannot be brought into a healthy state, will excite it as effectually as pus introduced into the system.*

On the contrary, Galen, Mr. John Hunter, and Dr. Willan contend, that hectic may be, and often is, a strictly idiopathic affection. The second of these valuable writers regards hectic fever as of two sorts, symptomatic and idiopathic.—(*On Blood*, part ii., chap. ix., sect. 1.) The first he ascribes entirely to local irritability, and opposes the idea that it is ever produced by absorbed pus. His argument is, that if absorbed pus be capable of producing it in one instance, it ought in every instance: but this we know is not the case; for we have had large buboes and even empyemas removed by absorption suddenly, and yet no hectic has taken place. He does not think that more pus is absorbed during the existence of hectic fever, than when no such fever is present: but, admitting that this should be the case, he would rather ascribe the increased absorption to the hectic constitution operating upon the abscess or sore, than to the abscess or sore operating upon the constitution; in which case the hectic diathesis is the cause, and the increased absorption is only the effect. So that, even here, he regards the hectic as a primary or constitutional disease.

As a symptomatic affection, however, he refers it to a general irritability of the constitution, produced by sympathy, in consequence of "some incurable local disease of a vital part, or of a common part when of some magnitude;"* and which becomes incurable from two causes; firstly, because, though the local irritation is small, the constitution is bad, and does not dispose the parts to a healing state: and, secondly, because, though the constitution is good, the local irritation is so considerable, that it cannot muster up a sufficiency of remedial energy to subdue it; and hence, while sympathizing in the irritable action, falls a prey to its own efforts.

Yet, says he, it is possible for hectic fever to be an original disease of the constitution; for the constitution may fall into the same mode of action without any local cause whatever, *at least that we know of*. And in this manner he accounts for its existence as an idiopathic affection. And, in effect, nothing is more common than for hectic fever to exist in patients in

* The late Dr. Thomas Young, when a boy, had every symptom of tubercles in the lungs, accompanied by hectic fever; but they never attained the stage of suppuration.—See his Practical and Historical Treatise on Consumptive Diseases, deduced from Original Observations, and collected from Authors of all Ages, 8vo., 1815.—ED.

* The period at which the commencement of hectic fever takes place from local irritation or disease, and also the severity of it, are influenced very much by the seat of the original affection, as well as by its nature and extent. "The system will much more readily sympathize with an abscess, or other disease of a vital organ, such as the lungs, heart, liver, stomach, intestines, mesenteric glands, or kidneys, than with a similar disorder, existing in the muscular or cellular tissue, near the surface of the body." Diseased lungs will more quickly bring on hectic symptoms than diseased joints; though, the power of joints to repair some of their injuries and morbid changes, being very inferior to those of many other parts, their diseases are often tedious, and frequently incurable, so that we cannot be surprised to find them often associated with hectic disturbance of the system.—ED.

whom we can trace no local cause whatever: and, in all such cases, we must either indulge in a gratuitous hypothesis, and throw our suspicions at random upon the lungs, or the liver, or the kidneys, or the heart, or the mesenteric glands, or whatever other organ a few casual symptoms may suggest to the fancy: or we must at least act upon the principle of its being an idiopathic affection, even though we should refuse, in terms, to admit that it is so.

"I willingly subscribe," says Dr. Percival of Dublin, in his manuscript comment upon the author's Nosology, "to idiopathic hectic, and have known it to last three months without any pulmonary affection, and then to break out in the lungs."*

There seems, indeed, great reason for admitting, with Dr. Stoll (*Prælect.*, p. 19), a *habitus phthisicorum*, a hectic diathesis or temperament, the features of which are, for the most part, strongly marked, and are to be found in a fair skin, blue eyes, yellow hair, lax fibre, and sanguine disposition. And, wherever this exists, it is probable that most of the causes of other fevers, operating upon it, will produce a hectic.† And we can hence readily account for the examples cited by different authors of its being produced by diseased actions or affections of the heart, stomach, mesentery, liver, pancreas, lungs, or brain; by a suppression of various exanthems, or other eruptions, or of various habitual discharges, natural or morbid; by other fevers; by chronic inflammations or abscesses. It is well known to be a common sequel to the measles, occasionally so to the smallpox, and, in a few instances, to rosalia, or scarlet fever. It may, hence, be a result of dyspepsy; and one case is said to have been produced by eating bacon, which remained undigested in the stomach for a term of eighteen months, when it was disgorged by sickness, and the hectic symptoms disappeared.—(*Arnold, Diss. de Hecticâ Stomachiâ*, 1743.) And it is hence possible that hectic fever may occasionally spring, like other remittents, from febrile miasm.*

The character of the disease is well given by Mr. John Hunter in the following words:—"Hectic may be said to be a slow mode of dissolution; the general symptoms are those of a low or slow fever, attended with weakness, but more with the action of weakness than real weakness; for, upon the removal of the hectic cause, the action of strength is immediately produced, as well as every natural function, however much it was decreased before. The particular symptoms are, debility; a small, quick, and sharp pulse; the blood forsaking the skin; loss of appetite; often rejection of all aliment by the stomach; wasting; a great readiness to be thrown into sweats; sweating spontaneously when in bed; frequently a constitutional purging."—To which he adds, "the water clear." There is, in reality, much difference of opinion upon this last point. Dr. Heberden has observed, that the same irregularity which accompanies most other symptoms of the disease, attends this also; that the urine is equally clear or turbid in the exacerbations and the intervals; sometimes clear in the first and turbid in the second; and sometimes turbid in the first and clear in the second; while Dr. Duncan, from long and assiduous attention, asserts, that the urine is peculiarly distinguished by a natural furfuraceous separation. Such is the character it has usually exhibited in my own practice: though, where authorities thus clash, it is not a symptom to be depended upon as a pathognomonic.

From the frequent approaches which the hectic makes towards a perfect apyrexy, it is sometimes apt to be confounded with an intermittent; but there is rarely any remission in which the pulse is not at least ten strokes in a minute quicker than it ought to be; and by this it is sufficiently distinguishable, as it is also by the greater irregularity of its different stages, and, indeed, of all its symptoms.

It is owing to this last feature that, sometimes, the exacerbation commences with a chilly fit, and sometimes without; and that, where there is a chilly fit, sometimes it is immediately succeeded by heat, but sometimes by perspiration, without any intervening hot fit; while occasionally the cold fit only leads to heat, or even terminates singly without either heat or perspiration. Hence the exacerbations must vary in duration: but even where every stage is pres-

* With regard to this case, the editor fully coincides with the remark made on it by Dr. Joseph Brown. "From the extreme difficulty of detecting the presence of tubercles in their unsoftened state, even with the improved method of diagnosis now employed, is it not reasonable to conclude, that these bodies had existed in the lungs undetected, and produced the fever; since we find this affection, which of all is most frequently attended with hectic, ultimately displaying itself by manifest signs?" Some years ago Dr. Brown saw a case of *apparently* idiopathic hectic, which proved fatal: on examination of the body, small abscesses were found in the muscular substance of the heart. —Cyclop. of Pract. Med., art. FEVER, p. 246.—ED.

† These are the commonly described emblems of a scrofulous habit in which tubercles, and other forms of local disease, are frequent. Instead of adopting the author's hypothesis, and that of *idiopathic* hectic, it would be more correct to regard hectic fever as a protracted constitutional disturbance, excited and kept up by some local irritation or disease, which is either not immediately curable, or totally incapable of relief. Mr. Hunter considered hectic fever as the *remote* consequence of a local injury or disease, contrasting it with sympathetic inflammatory fever, which he sets down as the *immediate* or earlier effect on the system. He also divides hectic fever into two kinds; one depending upon a disease which would be curable, if the constitution had strength enough to bear the struggle; the other arising from a disease that is absolutely incurable. When Mr. Hunter speaks of spontaneous hectic fever, he seems to mean really nothing more, than that the cause of it is not apparent.—ED.

* Hectic fever may follow visceral disease, brought on by other fevers, but certainly it cannot be correctly stated to be in any instance directly brought on by febrile miasm.—ED.

ent, and succeeds in regular order, the duration of the entire exacerbation is almost equally uncertain, insomuch that it is seldom that three exacerbations of equal length recur in succession. The remissions will sometimes extend to ten or twelve days, without a single intervening pyrectic symptom: and sometimes the cold or the hot fit, or the sweating, will be renewed several times in the same day. Yet, let the perspiration appear whenever it may, the patient is never relieved by it, but is as anxious and restless during its continuance as in the heat or chill.

Dr. Heberden (*Trans. of the College*, vol. ii., art. i., p. 6) has sometimes seen a hectic attack persons who seemed in tolerable health, in a sudden and violent manner, like a common inflammatory fever: and, like that, in a little time bring them into imminent danger of their lives; after which it has abated, and afforded hopes of recovery. But the hopes have been deceitful; for, the hectic has still been fed by some lurking mischief; some concealed local disease; and, resisting the power of medicine, has gradually undermined the patient's health and destroyed him.

More commonly, however, hectic fever commences slowly and insidiously, and is not suspected for some months: and the only symptoms noticeable are, lassitude upon slight exercise, loss of appetite, and a wasting of the flesh. But, if these symptoms be connected with a general increase of pulse, so that the artery beats from ninety to a hundred or a hundred and twenty strokes in a minute, there will be real ground for apprehension.

This is one of many diseases, in which the art of medicine has hitherto laboured in vain to strike into any direct track of cure. The real cause is commonly involved in great and impenetrable obscurity, and we can do little more than attack single symptoms as they make their appearance.

Where the disease is evidently symptomatic, the case must depend upon curing, or, if incurable, upon removing, when this can be accomplished, the part affected. When idiopathic, we must combat, as far as we are able, the irritable diathesis; and, above all things, endeavour to strengthen, without increasing, the action of the machine. The best sedatives as well as tonics are acids, and of these the vegetable will usually be found preferable to the mineral, since, on account of their corrosive property, the latter can only be taken in small quantities. They abate the febrile heat, diminish the restlessness, and frequently succeed in checking the night-sweats. And if, as is often the case, the patient be tormented with pains in the limbs or joints, resembling rheumatism, and preventing him from sleeping, we may combine the acids with opium. The bowels must be kept regular by gentle laxatives, and the neutral salts seem to answer this purpose better than most others. It will, however, be convenient to vary them occasionally, and sometimes to exchange them for the senna confection, or some other aperient.

Stimulants rarely answer any good purpose; and, in many instances, evidently heighten and accelerate the exacerbation. The Peruvian balsam has been given advantageously with nitre; but myrrh is a medicine of fairer promise; and beyond these, we can scarcely ever venture to proceed.

The lighter bitters are certainly serviceable in many cases, and may conveniently be employed in combination with the acids; but bark, though tried in numerous instances, and with great perseverance, has not been found successful. Dr. Heberden, however, says, that he never saw it do any harm in the hectic fever, and his opinion is confirmed by that of Sir Edward Hulse, after having prescribed it for forty years. Yet neither of them ever obtained proofs of any beneficial result.*

A light and regular diet, regular hours, and gentle exercise, are coadjutants of great importance. When the disease is dependant upon some local affection, the Bath waters have often afforded a palliative degree of relief; but in idiopathic cases, they usually augment the fever, aggravate the patient's sufferings, and hasten his death.

GENUS IV.
ENECIA.
CONTINUED FEVER.

ONE SERIES OF INCREASE AND DECREASE, WITH A TENDENCY TO EXACERBATION AND REMISSION, FOR THE MOST PART APPEARING TWICE EVERY TWENTY-FOUR HOURS.

We now enter upon the important genus of continued fevers, or those which run their course, not indeed without any change or relaxation whatever, as many of them were supposed to do formerly, and were distinguished by the term *continentes*, but with occasional and slight fluxes and refluxes, which bear the same proportions to the exacerbations and remissions of the epanetus, as these do to the paroxysms and intervals of the anetus, or intermittent. When there are two tides or fluxes within the twenty-four hours, the one occurs in the morning, and the other in the evening. The last is always the most distinct; and takes place usually between five and six o'clock, which is somewhat later than the latest of the paroxysms of genuine intermitting fevers; that of the quartan, which is the latest of the whole, usually occurring before five o'clock. It should also be farther observed, that, where continued fever discovers but one augmentation in the twenty-four hours, it is always that of the evening. Dr. Fordyce attempts to show that, even in a state of the firmest health, we constantly discover some tendency to a little febrile affection every evening; this he calls the natural evening paroxysm of fever; and to this habit

* The lighter preparations of bark, as the sulphate of quinine, and the infusum cinchonæ, are often found to be eligible tonics in hectic cases; yet they cannot be expected to accomplish much good, if the cause of the constitutional disturbance continue undiminished, or unremoved.—Ed.

he ascribes the existence of an evening increase of continued fever.

The genus thus defined and characterized, includes the three following species:—

1. Enecia Cauma. Inflammatory Fever.
2. ——— Typhus. Typhus Fever.
3. ——— Synochus. Synochal Fever.

Sauvages draws a line of distinction between these three from their respective duration, as well as from their more essential symptoms, affirming that the cauma terminates in a week at the farthest; the typhus in two, though sometimes protracted to three weeks; while the synochus reaches beyond the second, and often beyond the third week. As a general rule, this remark is worth keeping in mind; but, the deviations from it, in all the species, are too frequent to enable us to lay hold of it in assigning their specific character.

SPECIES I.

ENECIA CAUMA.

INFLAMMATORY FEVER.

HEAT GREATLY INCREASED; PULSE QUICK, HARD, AND STRONG; URINE RED; DISTURBANCE OF THE MIND SLIGHT.

This species has been distinguished by a variety of names by different nosologists and other medical writers; the chief of which are, *imputrid synochus*, which is that of Galen; *imputrid continued fever*, which is that of Boerhaave; *imputrid continent*, which is that of Lommius; *sanguineous continued fever*, which is that of Hoffmann; and *synocha*, which is that of Sauvages, Linnæus, Cullen, and most writers of the present day. Of these, Synocha, for reasons stated in the comment to the Nosological Synopsis, is the worst; it has no clear or correct etymological meaning; it has been used in different senses by different writers, and approaches so nearly to synochus, used as extensively by most of the same writers, as to create a perpetual confusion in the minds of young students; and the more so, as the disease before us is expressly denominated synochus by Vogel, while most writers employ this term to import a different species of fever. On all which accounts, I have judged it right to exchange synocha for cauma, a term already employed for the same purpose by Dr. Young, and which, derived from, καίω, "uro," is etymologically significant of the character of the disease it designates. The common English term, *inflammatory fever*, is excellent; and is, in truth, a direct translation of the Greek term cauma. Dr. Fordyce denominates it *general inflammation*: by which he clearly intimates, that this species of fever bears a near resemblance to the symptomatic fever produced by the local affections called phlegmasiæ, or phlogotica, which constitute the next order of the present class, to which the term *inflammations* is now commonly limited; but which Dr. Fordyce would distinguish by the term "*local inflammations.*"

In effect, inflammatory fever and the fever of inflammations bear the same relations to each other, as the idiopathic and symptomatic hectic: in both, there may be a general or a local remote cause; but, the influence upon the constitution will be the same, whatever be the source of excitement. It has been doubted, however, whether cauma or inflammatory fever ever exists without a local cause; and Dr. Cullen, who does not allow that hectic fever is ever found without a local cause, distinctly affirms, that he has never seen inflammatory fever existing under the same circumstances; whence Dr. Clarke, of Newcastle-upon-Tyne, who has too much generalized the subject, has struck inflammatory fever entirely out of the list of diseases, contending, that even the term inflammatory ought never to be applied to fever, excepting when fever itself only exists as a concomitant of some local affection:* while Dr. Clutterbuck, as we have already observed, has contended, that this local cause is at all times, and under every variety of fever, an inflammation of the brain. If, however, a cause of this kind be ever fairly made out, a variety of facts, of late detection, will be far more likely to fix it in an inflammation of the arteries, the ARTERITIS of the French writers, who have recently examined the subject at considerable length, especially MM. Portal (*Cours d'Anatom. Médic.*, tom. iii., p. 127, 1804), Dalbant, and Vaidy (*Dict. des Sciences Médicales: Journ. Complement.*, vi., Août, 1819); and to which Dr. Frank has, indeed, already ascribed inflammatory fever in one of its forms.—(*De Cur. Hom. Morb. Epit.*, lib. i., § 118, 8vo, Manheim, 1791.) But the subject is still involved in great obscurity, as it is doubtful whether the change of arterial structure, which has been found after death in many cases of supposed arteritis, has been really an effect of inflammatory action. In acute rheumatism, it is probably a frequent cause or concomitant; but this is a question we shall have occasion to return to under that disease. How far either hectic or inflammatory fever may, under particular circumstances of human or atmospherical constitutions, occasionally originate from marsh or contagious miasm, it is difficult to determine; but as Dr. Cullen was peculiarly desirous of reducing all fevers to these two sources; and as, to say the least, they are not obvious sources of either of the diseases in question, his mind appears to have received some bias from this fact in rejecting them from the list of idiopathic fevers. And as it has already been shown that this decision has laid a foundation for much of that "tug of war" in which many

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* Observations on Fevers, &c., 8vo., London, 1779. Though Dr. Tweedie does not distinctly represent this fever as being essentially connected with local inflammation, as a cause, he observes, that "it is necessary to bear in mind the local inflammations which almost invariably arise in the course of these acute fevers, and the effect of such complications on the febrile symptoms."—See Dr. Tweedie's Treatise on Continued Fever and its Modifications, p. 49, 12mo., Lond., 1832 — EDITOR.

distinguished members of the profession have of late years been engaged, respecting the nature and treatment of particular species of fever, it is highly probable, also, that several of the more recent hypotheses, concerning its proximate cause, have originated from the same spring.

Inflammatory fever, as it has often occurred in the author's own practice, and in that of others who have described it, usually commences with the symptoms of an acute ephemera, and may in fact be contemplated as the same disease running on from four or five to about eleven days, without intermission, or a renewal of the cold fit. It commences with a sense of languor and inaptitude for exertion, with a disrelish for food, which continues for a day, or perhaps two. There is then chilliness and soreness over the surface, with nausea and headache, succeeded in the evening by a great increase of heat, and at night by perspiration, with great thirst, restlessness, and sometimes delirium; sometimes, in young persons, convulsions, with a stupid drowsiness. The bowels are usually costive, the urine high-coloured, and the pulse quick and hard.

With Dr. Fordyce, the grand pathognomonic symptom of cauma is hardness of the pulse. This accompanies it from first to last, in its simplest and in its severest state. When the disease is mild, it is hard alone; when more violent, it is at the same time full, strong, and frequent. The obstructed pulse is often confounded with the hard, and it is not easy to distinguish them without considerable practice. There is rigidity of resistance to the finger in each, but of a different kind. In the hard pulse, it is much firmer and tenser; and is supposed by Dr. Fordyce to result from such an increase of arterial contraction as to overbalance its correspondent dilatation. It indicates, in his opinion, a very high degree of living power, and is peculiarly characterized by a tardy coagulation of the blood when drawn freely into a hemispheric basin, in consequence of which the red particles have time to subside, and leave the surface colourless, or with a buffy appearance. In the obstructed pulse, on the contrary, the blood coagulates at once; and, the red particles not having time to separate, the surface is of the same hue as the cake below.

The disease sometimes terminates abruptly with a critical sweat, or some other evacuation, on the fourth or fifth day; but more usually increases in violence, though with occasional declinations, for a week longer; during which time the pulse rises to a hundred, or a hundred and ten strokes in a minute, but continues regular; the nausea subsides, and the patient will take and retain whatever is offered to him of simple nutriment or medicine; the thirst is less violent, but the tongue is deeply furred, and the lips are parched.

The disease is not often dangerous; and about the eleventh day gradually subsides, or yields to some critical discharge, which is usually that of a free and alleviating perspiration. The pulse soon sinks to eighty, and the chief symptom is weakness.

During the course of the fever, every organ suffers from its morbid and increasing impetus; but they do not all suffer alike: for in some parts there is, occasionally, a greater resistance to the flow of the circulating fluid than in others, whence that acute pain, which is often complained of in the head or the side: in the latter case, sometimes amounting to pleuralgia. And, not unfrequently, the vessels of one part will give way more readily than those of another, and there will be a sense of heaviness and oppression in the head, the heart, or the lungs; as though some effusion had taken place, which, in some instances, is perhaps actually the case. If the head be much affected, delirium is a frequent result, with ravings and violence, rather than the low muttering incoherence of asthenic fevers.

From the history already given of the malignant causus, or ardent malignant remittent, it appears probable, that inflammatory fever may sometimes be produced from febrile miasm, though it is commonly derived from other sources. Of these, the stimulus of violent passions is, perhaps, one of the most common; and especially upon a vigorous and plethoric habit, which is the usual temperament in which inflammatory fever makes its appearance. Undue muscular exercise, heating foods, or excesses of any kind in the same habit, are also frequent causes; while another may be found in the suppression of any accustomed discharge, as that of menstruation, epistaxis, or periodical bloodletting. Suddenly suppressed perspiration is, in like manner, a frequent, perhaps the most frequent cause of any; especially when the body is very hot, and the change is effected by exposure to a temperature of great cold, applied externally or internally, as that of a current of cold air, a large draught of cold water, or plunging into a river.

Some writers, as Sennert and Crichton, have supposed inflammatory fever to be occasionally produced by an absorption of bile into the bloodvessels under the excitement of a tropical sun, or of a torrid summer in milder regions; and they suppose that the bile is, in this case, possessed of a more than ordinary degree of acrimony, and that the symptoms are varied by a more pungent heat and more intolerable thirst, with a more scanty secretion of urine, preternaturally acrid and high-coloured.

That bile of this description is often forced back into the system under the circumstances here supposed, is unquestionable; as it is also that inflammatory fever is a frequent accompaniment of this morbid change. But, notwithstanding the above authorities, such fever seems less attributable to the reflux of bile into the blood, than to the insolation or solar excitement; which, by unduly stimulating the liver, has been the cause of an overflow of bilious secretion. How far a more irritant or exalted acrimony may be communicated to bile thus operated upon, or what may be its effect upon the system, admitting it to take place, it is dif-

ficult to determine; but there is much reason to doubt whether genuine bile in the sanguiferous system is ever a cause of fever, or stimulates the heart or arteries to increased action. For if this were the case, jaundice would always be accompanied with inflammatory fever. Instead of which, however, we find it accompanied with atony instead of entony, or diminished instead of increased power.*

Sauvages gives a case, in which inflammatory fever was produced by a mechanical irritation of the meninges of the brain, by a lodgment of vermicles in the frontal sinus, of which seventy-two were discharged during a fit of vomiting and sneezing, from which time the patient began to recover.

These vermicles were most probably the larvæ of some species of the œstrus, or gadfly, which had crept up into the frontal sinus, after being hatched in the nostrils, in which the parent insect had deposited her minute eggs. This is a very common affection in grazing quadrupeds, and especially in sheep, which are often peculiarly tormented, and sometimes driven almost mad, by the violence of the irritation.

Stoll gives a case in which the brain, on examination after death, was found deluged with serum—diluvium serosum.—(*Mat. Med.*, iii., p. 294.) But such an appearance is rather to be regarded as an effect, than a cause of the disease; as an instance of *cephalitis profunda*, in consequence of the brain having suffered more than any other organ from the inflammatory impetus.

Hence the following varieties are noticeable under the present species:

a Plethoricum. Plethoric inflammatory fever.	Produced in a plethoric habit by great mental or muscular excitement, or heating foods; or by a sudden suppression of perspiration, or of other accustomed discharges.
β Biliosum. Bilious inflammatory fever.	Accompanied with an excessive secretion of bile, absorbed into the sanguineous system.
γ Pleuriticum. Pleuritic inflammatory fever.	Accompanied with a violent stitch or pain in the side.
δ Cephalalgicum. Cephalalgic inflammatory fever.	Accompanied with acute pain in the head.

As an inflammatory diathesis constitutes the essence of this fever, the cure must depend altogether upon a reduction of the vascular, and especially of the arterial entony: always bearing in mind the possibility, that the disease may suddenly lose its inflammatory character, and rapidly pass into that of a typhus. Regulated by this view, we should generally commence with bleeding and cooling purgatives. There are a few cases, indeed, in which bleeding may be dispensed with, as when the habit is by no means plethoric, and the pulse is obstructed rather than hard; but these are cases that rarely occur. Diaphoretics, or relaxants, as they are denominated by Dr. Fordyce, may then be employed with advantage. Of these, the tartarized antimony, the antimonial powder, or James's powder, are chiefly to be relied upon; and may be given alone, or, which is often better, in saline draughts; and particularly those formed of the acetate of ammonia. And it may not be amiss to observe here, that the acetate of ammonia is sometimes prepared in the form of crystals, and sits more easily on the stomach in this than in any other shape. When given as a liquid, it is of importance that the solution should retain the carbonic acid gas of ammonia as largely as possible; and, for this purpose, the union should take place in a strong close vessel. According to Bergman, nearly half the weight of ammonia depends upon the quantity of this gas which it contains: so that in a pint of the solution of the acetate of ammonia, comprising four drachms of the latter, there will be extricated, if made in the manner here recommended, little less than a hundred and sixty cubic inches of air.

As the stomach is for the most part but little affected, emetics, if used at all, can only be employed for the purpose of determining to the surface; but, as we can do this by the antimonial and other diaphoretics just referred to, as also by diluent drinks, it is hardly worth while to irritate the stomach in order to accomplish the same purpose. Perfect rest of body and mind, a reclined position, and a light liquid diet, destitute of all stimulants, are also indispensable towards recovery. The air should by all means be kept pure by being constantly renewed, though without a sensible current; the temperature cool; the clothing light, and as often changed as may be necessary to maintain cleanliness; and the beverage, toast-water, lemonade, or cool tea.*

* Inflammatory fever in the United States is not unfrequently caused by the action of solar heat, and the influence of sudden vicissitudes in the temperature.—D.

* Our author has here omitted all notice of cold affusion, the advantages of which, in the acute or inflammatory forms of fever, have been acknowledged by almost every writer. The effect of it is to diminish the heat of the body, to lower the pulse, and to bring on perspiration and sleep. As a general rule, the sooner the affusion is applied after the irregular chills of the first stage are over, the better, provided the heat of the skin is steadily above the natural standard. Dr. Currie deems the safest time for it to be that when the exacerbation is at its height, or immediately after the commencement of its declination. At this period the heat rises one or two degrees in the central parts of the body, and still more in the limbs. Dr. Currie, therefore, generally directed affusion to be employed between six and nine o'clock in the evening. It is never to be resorted to when any considerable sense of chilliness exists, notwithstanding the thermometer may indicate an augmented temperature of the body. Neither ought it to be adopted when the heat, measured by the thermometer, is less than, or only equal to, the natural heat; nor when the patient is perspiring profusely. Dr. Tweedie informs us, that he has never seen a single case in which cold affusion succeeded in cutting short the fever, though all

After all, however, it is not often that examples of pure inflammatory fever are to be met with in the present day; and it is contended by very high authorities, and seems to be established by the medical records of earlier times, compared with those of our own, that it is a disease far less common now than it was formerly; and that it is seldom, to adopt the words of Mr. J. Hunter, "that physicians are obliged to have recourse to the lancet,* at least to that excess which is described by authors in former times. They are now more obliged," continues the same writer, "to have recourse to cordials, than evacuations; and, indeed, the diseases called the putrid fever, and putrid sore throat, are but of late date. I remember when the last was called Fothergill's sore throat, because he first published upon it, and altered the mode of practice. I remember when practitioners uniformly bled in putrid fevers; but signs of debility and want of success made them alter their practice. Whether the same difference takes place in inflammation, I do not know, but I suspect that it does in some degree; for I am inclined to believe that fever and inflammation are very nearly allied, and that we have much less occasion for evacuations in inflammation than formerly; the lancet, therefore, in inflammation, and also purgatives, are much more laid aside."—(*On Blood*, &c., part ii., p. 227.)

It is not easy to account for this change in the national temperament. It is common, indeed, to ascribe it to an alteration in our mode of life, which is asserted to be much fuller than that of our forefathers. "We may be said," says Mr. Hunter, "to live above par. At the full stretch of living, therefore, when disease attacks us, our powers cannot be excited further, and we sink so as to require being supported and kept up to that mode of life to which we have been accustomed."

If this be a correct view of the times in Mr. Hunter's day, they have greatly altered and improved within less than half a century; for there has never been a period, since wines and fermented liquors have been introduced among us, so temperate and sober as the present. Drunkenness, which was formerly common in our streets, is now rarely met with; suppers are almost entirely relinquished; and, instead of its being disgraceful, as was the case in "the olden time," for the master of the house to let his guests leave him either sad or sober, nothing is now so disgraceful as intoxication. It is true, we are got back again to a very free use of the lancet in many instances; which would seem to show, that we had completed a revolution in our general temperament, as well as our general temperance; but it is not a little singular, that, while the lancet is still used with comparative caution in inflammatory fever, it is chiefly employed, and often unsparingly, in typhus or putrid fever. And hence, there is more reason, I fear, for suspecting a revolution in the professional fashion, than in national temperament; and that the bold and the timid plans have been alternately introduced and alternately dropped, not so much from any radical change in the constitution, as from their being found to fail, because employed as popular means, or under the influence of some favourite hypothesis, on all occasions, without a due degree of clinical discrimination, or attention to the habits or symptoms of individuals at their bedside.

SPECIES II.
ENECIA TYPHUS.*
TYPHUS FEVER.

PULSE SMALL, WEAK, AND UNEQUAL; USUALLY FREQUENT; HEAT NEARLY NATURAL; GREAT SENSORIAL DEBILITY, AND DISTURBANCE OF THE MENTAL POWERS.

THE term is derived from Hippocrates, who uses it, however, in a sense not exactly parallel with its application in modern times, but rather in reference to that low, muttering, and stupid delirium, which so frequently accompanies the disease. It is, nevertheless, admirably expressive of the general nature of the fever to which it was applied at first, and which it designates at present; which burns, not with open violence as the cauma, but with a sort of concealed and smothered flame; for the Greek term τύφω signifies "to smoulder," or "to burn and smoke without vent."†

Any of the ordinary causes of fever may be a cause of typhus; for the typhoid form is often dependant upon the character of the constitution into which it is received, as evincing a great deficiency of sensorial power: and hence cold,

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the patients so treated felt afterward greatly relieved. He sets down the practice as best adapted to inflammatory fever (synocha), and more especially to the fevers of hot climates, which are accompanied by much greater excitement than those of temperate countries. He advises the practitioner, however, to ascertain, in every case, before such a powerful remedy is administered, that there is no visceral inflammation; "were such a powerful shock given to the system under these circumstances, dangerous and even fatal consequences might ensue." On account of these reasons, and the manner in which most patients object to cold affusions, Dr. Tweedie prefers sponging the surface of the body with cold water, or vinegar and water. In winter the fluid used may be tepid, if more agreeable to the patient.—See Dr. Tweedie's Treatise on Continued Fever and its Modifications, p. 187, et seq.; also, Dr. James Currie's Med. Reports on the Effects of Water, cold and warm, as a Remedy in Fever, 8vo., Liverpool, 1798.—ED.

* These remarks cannot certainly apply to this type of disease, as it occurs in the United States. —See Miner and Tully's Essays on Fevers, Middletown, 8vo., 1823.—D.

* A peculiar form or type of fever, characterized by the more early and severe affection of the brain and nervous system; by the more constant changes which the mucous membranes undergo; by affection of the cutaneous and glandular systems; and, in the advanced stage, by great prostration and symptoms denoting putrescence."—Dr. Tweedie on Continued Fever, p. 76.

† The name of this fever is sometimes believed to be derived from the Greek word τυφος, signifying *stupor*.—ED.

mental agitation, excess of muscular labour, and even intemperance, which, in a high entonic habit, might generate synocha or inflammatory fever, will often, in a debilitated constitution, and especially when the debility depends primarily upon the state of the nervous system, and the nervous influence is recruited with difficulty, give a typhous complexion to the disease from the first.

But though all the causes of fever may in this way give rise to typhus, its common cause, as we had occasion to notice when treating of the remote causes of fever (Cl. I., Ord. I.), is febrile miasm, issuing from the decomposition of human effluvium, under the influence of the ordinary auxiliaries of a close and stagnant atmosphere; still farther corrupted by a load of foreign exhalations from dirt or filth of any kind, and of that degree of warmth and moisture which must always exist where society exists, and especially where it exists in too crowded a state. Under these general circumstances, a very low degree of warmth and moisture is sufficient, though there must be some proportion of both. And, provided there be an adequacy of warmth, the lower the temperature, the more certainly an individual becomes affected; not from a more abundant generation of febrile miasm, or from its being more volatile,—for, on the contrary, it is here perhaps less abundant, and even less volatile,—but from the more depressed state of the living power, and the less resistance it is capable of offering to any morbid influence whatever.

I have just remarked, that, under a depressed state of the living power, whatever be its cause, whether a want of cheerful warmth, cheerful passions, cheerful food, or cheerful and regular habits, typhus is often more likely to take place than any other species of fever. But when febrile miasm, produced by a decomposition of effluvium from the living body, exists in co-operation with these, it is almost impossible for an individual to escape; as the miasm thus generated has a specific power—a power beyond all other febrile causes whatever—of lowering still farther the vital energy as soon as it is received into the system, and thus of confirming the previous tendency to this peculiar type.

All this, indeed, has been observed already, though it is necessary to revert to it on the present occasion: it has also been farther observed, that, when a typhus has, in this or any other manner, once arisen, the effluvium from the living body during its action is loaded with miasm of the same kind, completely elaborated as it passes off, and standing in no need of the decomposition of the effluvium for its formation. In many cases, indeed, all the secretions are alike contaminated; and hence, febrile miasm is often absorbed in dissection, by an accidental wound on the hand, and excites its specific influence on the body of the anatomist; for in this way, also, typhus has been produced.

Hence, typhus becomes infectious; but as the miasm it generates, though more suppressive or exhaustive of sensorial energy, is less volatile than that of marsh-lands or dead organized matter, its infectious power is confined to a much more limited atmosphere than that of fevers arising from this latter source. And, on this account, fevers originating in jails, or other confined and crowded scenes, are less extensively communicable than the yellow fever, or that of hot climates and exhaling swamps.

It may be also necessary to remind the reader of another remark already made, that, in a pure atmosphere, the miasmic materials, from whatever source derived, become dissolved or decomposed; but this happens slowly and with great difficulty, perhaps not at all, in a vitiated atmosphere, already saturated with foreign corpuscles. In a state thus crowded, moreover, they less readily disperse or ascend beyond their proper periphery of action; and where they are less volatile, as when issuing from human effluvium, they perhaps adhere by a peculiar tenacity to bodies more ponderous than themselves, and thus loiter for a still longer period within the stratum of human intercourse. And hence, the fouler as well as the more stagnant the atmosphere, the more general, and, from the former cause, the more malignant the disease; for, as nothing is so contributory to the preservation of sound health as pure air, so nothing tends so much as foul air to prolong or aggravate diseases of every kind. And hence, again, we have an obvious and sufficient reason, why typhus should become more severe in proportion as it spreads and impregnates a given space with its specific miasm and accompanying colluvies.

To what extent febrile miasm, issuing from the source before us, may spread in a free influx of pure air without becoming dissolved, or, in other words, so as to retain its contagious power, has never been very accurately ascertained. We know, however, that its range is very circumscribed, and reaches to but a very small distance from the patient, or the nidus of foul clothes or utensils in which it may be lodged; and never infects a person in an adjoining street, or house, or room in the same house; nor even, as Dr. Haygarth has observed, in the patient's own chamber, if large, airy, and kept clean: a remark that has since been confirmed by Dr. Baillie. "With respect," says he, "to the contagious nature of these fevers, I am convinced, that it is in general not considerable. I do not recollect an instance in which a patient in that hospital (St. George's) communicated the infection to a patient lying in the next bed. When patients are crowded together, and the apartments are ill-ventilated, I entertain no doubt of this species of fever being capable of being communicated from one individual to another."—(*Lect. and Obs. on Medicine*, 1825, unpub.) [Dr. Alison, in his description of the epidemic fever of Edinburgh, in 1827, likewise particularly mentions, that, in the men's ward of the hospital, there was no instance of any patient, admitted on account of other complaints, taking fever in the house, notwithstanding its continued presence on the opposite side of the ward. In the women's ward, however, two or three patients, admitted

on account of other complaints, took fever. Notwithstanding what happened in the men's ward, this intelligent physician adduces many convincing facts in support of the doctrine, that fever spreads, not from malaria, but from contagion communicated by intercourse between the healthy and the sick.—(*Alison, in Ed. Med. and Surg. Journ.*, No. xciii., p. 234, et seq.)]*

It is also of great importance to know, that typhous miasm, like the specific miasms of exanthems, does not render clean clothes of any kind contagious; or, in other words, does not adhere to, or harbour in them. When, however, they are not clean, they may unquestionably be rendered contagious; and hence, it is probable, that the animal filth with which they are impregnated, while it is a source of additional miasm, becomes a fomes of that already formed, and separated from the patient's body.

A susceptibility, however, to diseases of every kind, varies considerably in different individuals; and hence many persons, upon an equal exposure to typhous contagion with others, receive it far less readily, and, in some cases, seem to be almost favoured with a natural immunity. As we have already remarked, that a peculiar state of body gives a peculiar tendency both to generate and receive typhus, we can easily conceive that, where the body is in an opposite state, it must be much less susceptible of its influence; and we are thus put in possession of a general cause of escape. But there seems to be something beyond this, dependant, indeed, not upon the incidents of more vigorous health, or higher animal spirits, but upon the nature of the idiosyncrasy itself.

Dr. Haygarth has endeavoured to determine, from very ingenious and plausible data, the average proportion of those who in this manner remain exempt from contagion, while spreading on every side around them. And he limits the immunity to one in twenty-three; for he tells us that, when one hundred and eighty-eight men, women, and children, were exposed fully to the typhous contagion for days and nights together, in small, close, and dirty rooms, all of them, except eight, were infected with this fever.—(*Letter to Dr. Percival*, p. 31.) And he has farther endeavoured to show, that the miasmic poison, when received into the body, continues in a latent state for seven days from the time of exposure to the contagion, before the fever commences; and may continue in the same state for seventy-two days, beyond which we have no instance of its producing any effect. And this deduction is in pretty close unison with the experience of Dr. Bancroft (*Essay on Yellow and Typhus Fevers*, p. 515), who, in ninety-nine cases of orderlies and nurses that attended the English army, on its arrival at Plymouth from Corunna, in 1809, observed that they were rarely attacked with fever earlier than the thirteenth, and in no instance later than the sixty-eighth day. [In numerous instances, however, brought forward by Dr. Marsh,* the latent period of typhus, or the interval between the receipt of the contagion and the beginning of the symptoms, was a very short period; and the infection taken so instantaneously, as it were, that doubts arose, whether the contagion had had time to operate through the medium of the absorbents.]

* On the subject of the communicability of typhus by one person to others, Dr. N. Smith remarks (A Practical Essay on Typhus Fever, New-York, 1824), "it is impossible for me not to believe this fever contagious, though it may not perhaps be so certainly and readily communicated as some other contagious disorders."—D.

* See Marsh on the Origin of Fever; Dublin Hospital Reports, vol. iv., p. 456, &c. Dr. Elliotson never saw an instance in which typhus fever showed a contagious character (Med. Gaz., 1832, p. 146); nor has the editor of this work ever noticed the occurrence even in the great prisons which he has now attended more than seven years. No doubt, however, where many cases of severe fever are brought together, and the effluvia from the patients concentrated, the disorder will sometimes assume a very infectious nature. The records of the Fever Hospital seem to leave no doubt of typhus being contagious under certain conditions; for every medical officer, every servant there, and every person employed in washing the linen of that institution, have all had typhus. Some have had it more than once, and others have died. Yet, nothing of this kind has happened at the Smallpox Hospital, which is on the very same spot. And, as Dr. Elliotson remarks, this fact is very important, as clearing up the point, whether all these persons have had it through the emanations of the patients in the Fever Hospital, or through the situation. The following passage from Dr. Elliotson's lectures is highly instructive:—"You will find an argument against the contagion of typhus fever adduced from this circumstance, that it will sometimes disappear during an extreme temperature, and it will sometimes disappear altogether, without any obvious reason; whereas, if it were contagious, it is argued, it would spread from one to another, till all, or the greater part, had suffered from it. It is said, that it is only a disease which depends upon a particular state of the atmosphere, and not upon an emanation from a diseased person; and that, therefore, it is suspended by the extremes of temperature, or will suddenly cease, without any obvious reason. It is, indeed, true, that non-contagious yellow fever, and intermittent and remittent fevers, and other diseases decidedly not contagious, will be aggravated or repressed by extremes of temperature, and by causes not discoverable. But this is exactly the case, not only with typhus fever, but with diseases which all people of common sense allow to be contagious. Epidemic smallpox is frequently checked by extreme cold. The plague, which, I believe, almost everybody allows to be a contagious disease, in the strict sense of the word,—*not infectious*, but *contagious*,—is also stopped by extreme heat or cold. Smallpox is frequently so stopped, and likewise by the wind called *harmattan*, which also arrests the plague; and, what is curious, this wind will prevent persons from taking the smallpox, even if they be inoculated. Hooping-cough and measles, which most persons allow to be contagious, are generally checked at the height of summer; and Sydenham says, that scarlatina is most prevalent when the summer is over." If such, and some other irregularities, will occur in the case of diseases known to be contagious, there is no reason at all to doubt that typhus fever is contagious, merely because it will suddenly cease in a dis-

Man is so much the creature of habit, that his constitution is, in a thousand instances, brought by degrees to endure poisons of the most fatal power. This we see daily in the use of opium and ardent spirits; and we shall in due time have to notice something of the same kind, even in plague. This adaptation of the constitution, however, to the circumstances by which it is surrounded, is in nothing more conspicuous than in the fever before us. Not, indeed, in all persons,—for all do not possess the same pliability of constitution,—but in those who are endowed with it. And hence, one reason why nurses, and perhaps hospital-surgeons, escape so often without injury, and especially why prisoners, brought into a court for trial, remain themselves occasionally in perfect health, while their clothes are so impregnated with the contagious miasm as to infect a whole court, and communicate the disease to the judge or others who are at the greatest distance from them; of which we are furnished with melancholy examples in the Oxford assizes of 1577, those at Exeter and Taunton in 1586, those of the Old Bailey in 1736 and 1750; besides similar instances in various hospitals and ships of war.*

There are other persons again, as Sir John Pringle has well observed, whose constitutions, forming a middle line between those who readily receive and who powerfully resist the contagious aura, are affected only in a modified degree. They bend to the assault, but are not cut down by it. They become feeble and irritable; the sleep is disturbed; the tongue white in the morning; the appetite impaired; the smallest exertion fatigues them, and accelerates the pulse; and, in this state, they remain for weeks together, and at length recover without any formal attack of fever.

We have seen that the same influence of habit exists under yellow fever; during which the natives of those climates where its remote causes are in almost perpetual operation, suffer far less when it attacks them, and are far less susceptible of its attack.

But, though febrile miasm, issuing from a decomposition of human effluvium, has a peculiar tendency to generate typhus, we have seen that the same miasm, issuing from a marsh effluvium, or a decomposition of dead organized matter, under a peculiar state of modification, has produced remittents with a typhous character, and sometimes specific typhus itself.—(*Epanetus malignus asthenicus, suprà*, Cl. III., Ord. I., Gen. III., Species 2, δ.) And as, in this case, the miasm is apt to spread more widely, typhus has, by many writers, been said to be occasionally epidemic. When, however, the disease issues from this source, it is far more generally in temperatures too low than too high and heated; since, as already observed, cold, and especially cold and moisture, have a peculiar tendency to depress the living power; and hence this disease is said to be almost stationary at Carlscrone, or at least to have lingered there for four or five years on some occasions.—(*Foxe, Neuen Schwed. Abhandl.*, band. viii.)

[The opinion that the type of fever has not an exclusive connexion with its cause, and that it depends much upon atmospheric influence or constitutional diathesis, is supported by Dr. Marsh (*Dublin Hospital Reports*, vol. iv., p. 519, et seq.), who cites several cases in which exposure to typhoid contagion was believed to have occasioned intermittent and remittent fever; and to puerperal infection, typhus.]

Typhus, therefore, originating from different causes, and all these causes modified in their action by collateral circumstances, may readily be supposed to be accompanied with very different symptoms, and to appear under very different degrees of severity. The chief varieties, however, are the two following:

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trict, without our knowing why, or because it is apparently arrested by atmospheric change.—See Elliotson's Lectures, delivered at the Lond. University, published in Med. Gaz., 1832, p. 147.—Ed.

* Many facts connected with the progress of contagious or infectious disorders as they have prevailed under different circumstances in the U. States, might be here adduced in corroboration of the views in the above paragraph. Some striking instances of exemption from the influence of febrile infection have been presented by intemperate persons, who, in seasons when yellow fever prevailed extensively, have passed unmolested by it, though exposed to the disorder in every possible manner; while temperate individuals, coming from the pure air of the country, and unassimilated to the peculiar atmosphere of an infected city, have sickened and died soon after their arrival. The same remark will hold good in regard to the effects of febrile infection on individuals unaccustomed to its influence, when from accidental causes they have been brought within its power, by imprisonment in jails, or by confinement in hospitals and alms-houses. We think that the medical reports of our hospitals would furnish many proofs of this law of infection, as it applies to typhus fever. We shall here mention only one instance recorded by Dr. Francis, which occurred in the city prison or Bridewell of New-York. "About the 16th of July, 1814," says Dr. Francis, "several cases of the *typhus carcerum* appeared in the Bridewell of New-York. The disease was first observed to exist in an apartment of the prison commonly called the eastern wing, a room about fifty feet long and twenty-five broad. In a very few days after, the complaint became general; and out of eighty-five individuals at that time confined in this part of the building, nearly forty were taken ill with symptoms characteristic of typhoid fever. The disease was produced from the local circumstances of the place, the crowded condition of the ward, the want of cleanliness about the persons and in the clothing of the prisoners, and the neglect of free ventilation. The increased impurities of the atmosphere seemed to give additional activity to the virulence of the disease; of the persons thus affected, a large majority were those who had come from a pure atmosphere, and were but recently subjected to the noxious air of the place, several not more than thirty or forty hours, and many not more than three or four days. The infection was more readily communicated to those, too, who were naturally possessed of vigorous and robust constitutions, and its effects were in most cases more violent upon persons of this description than on others."—See Hosack's Med. Essays, vol. i., p. 355.—D.

α Mitior. Nervous fever.
γ Gravior. Putrid fever.

The FIRST VARIETY, or MILD TYPHUS, was called by Dr. Huxham *febris lenta nervosa*, and has hence been commonly distinguished by the name of low or slow NERVOUS FEVER, from the great languor and dejection of mental or sensorial power with which it is always accompanied, and, on this account, it has sometimes been denominated *hysterical fever*.* It is particularly characterized by slight shiverings; heavy vertiginous headache; oppression at the præcordia; nausea; sighing; despondency; coma, or quiet delirium; whey-like urine.

When the disease appears sporadically, it is usually under this form. There is nothing alarming to the patient's friends on its accession. The first symptoms are slight, the tongue exhibits little change, and the pulse is only a little quickened and somewhat smaller than usual; at the same time, however, there is great anxiety and depression of mind; so that the symptoms do not much differ from a mild and comparatively insignificant fever of any kind, operating upon a nervous temperament. But, as the disease advances, all the symptoms of sensorial debility become severer; the skin, which has hitherto been mostly dry, will, about the third day, be covered with profuse, clammy, debilitating sweats, while the heat is still inconsiderable, and the countenance pale and sunk. The sweat is often offensive to the smell, frequently acid, and sometimes, according to Stoll (*Rat. Med.*, iii., p. 79), as sour as the sharpest vinegar. About the tenth day, the weakness greatly increases; all the limbs tremble; and the tremours soon become convulsive, with a despondency and alienation of mind, at first observable only in the night, but soon continuing with little intermission: the delirium is of the mild or quiet sort, and rarely amounts to phrensy.

The disease often runs on to the twenty-first day, and, occasionally, to a much longer period. It is seldom marked by that sudden change which can be called a crisis; but gradually becomes more aggravated in its symptoms, till it reaches a fatal termination; or slowly advances to convalescence, by evincing a disposition to natural sleep; more steadiness and firmness of pulse; a more favourable countenance; a tongue more florid at the edges; a firmer and more collected mind, and a returning desire for food, often, indeed, capricious, but without nausea or sickness.†

In an anomalous and very singular case related by Dr. Satterley (*Med. Trans.*, vol. v., art. xxii.), the desire for food, which at first was greatly loathed in whatever form offered, reappeared about the fifth day, with an enormous craving, which it was impossible to satisfy. Animal food was preferred, but food of any kind was swallowed voraciously; and, when food was not allowed, various indigestible substances were devoured in its stead. This desire returned with every returning ingravescence of the fever, which adhered to no regular period, and it continued as long as the ingravescence lasted, which was usually ten or twelve hours. The disease extended with numerous variations to upwards of thirty days, when the fever unequivocally subsided, and the patient gradually recovered.*

Of the treatment we shall speak, after considering it in its severer forms.

The heavier, severer, or PUTRID TYPHUS, chiefly differs from the mild in the violence and rapidity of its march, and the marked and undisguised character it assumes from the first. While the mild, therefore, commences insidiously with only slight shiverings, the heat scarcely above the natural temperature, and the pulse small, and only a little quickened, the heavy typhus opens with sensible and alternate rigour and heat, succeeded by little or no perspiration; the pulse is tense and hard, usually quick, but fluttering; with pain over the forehead and crown; urine alternating from limpid to turbid; delirium succeeded by stupor; purple dots or patches, and other early signs of putrescence.

From the last feature, the disease has derived its common name, of PUTRID FEVER; as it possesses the additional names of JAIL, CAMP, and HOSPITAL FEVER, from its appearing so frequently in these situations: while, from the purple or flea-bite spots, which last are often called petechiæ, or, as it should rather be written, petecchiæ, this variety has been very generally treated of at home, under the name of SPOTTED FEVER, and on the continent under that of *febris petechialis*, or *petechizans*; sometimes, as by Follini (*Orat. de Nat. Feb. Peticularis*, Colon., 1722, 8vo.) and Matarasius (*De Febr.*

* Manningham on the Symptoms, Nature, and Cure of the Febricula, commonly called the Nervous or Hysterical Fever. Lond., 1776.

† The following are some of Dr. Tweedie's observations on this fever:—"In typhus mitior the febrile symptoms are mild, though it is evident, from the intellectual disorder and prostration, that the nervous system is much affected. Probably, at the commencement, there is no inflammatory action in the brain, the whole of the phenomena, viz., great languor, feeling of debility, muscular prostration, soft, feeble pulse, giddiness, intellectual dulness, and transient delirium, being the result of the peculiar operation of the febrific causes on the nervous system. Sub-acute inflammation of the brain often supervenes on this condition of the nervous system; and, when this takes place, the more prominent symptoms of cerebral inflammation are recognised; and to the difference in the intensity of the cerebral affection, may be traced the infinite variety of nervous symptoms, which individual cases present."—See Tweedie on Continued Fever, p. 80.—ED.

* Dr. N. Smith states a curious instance of the effects of this disease on the moral principle—"a patient in particular who had been extremely sick with this disease, after his recovery, had a strong propensity to steal, and did in effect take some articles of clothing from a young man to whom he was under great obligations for the care he had taken of him during his sickness. He at length stole a horse and some money, and was detected and punished. I took some pains to inquire into the young man's former character, and found it good, and that his family were respectable."—Essay on Typhus, p. 32.—D.

petic. malign. contagiosis, &c., Mezarini, 1722, 8vo.), under that of *febris peticularis*; sometimes, as by Jacobi and Morelli (*De Feb. purp. epid.*, Lion., 1641, 8vo.), that of *febris purpurata*; while by A. Castro it is termed *febris punctularis* (*Febris maligna punctularis aphorismis delineata*, Tub., 1693); and by De Cermona, *febris cum punctulis.*—(*Tract. de Peste et febr. cum punct.*, Sevilla, 1581, 8vo.) By the Spaniards, it was hence vulgarly denominated tavardillo or tabardillo, from tavardo, a spotted cloak formerly in common use. It is a termination very common in various parts of America. These punctæ or vibices, however, are nothing more than symptoms of putrescence; and are common to other fevers, and even to diseases without fever, as land or sea scurvy (*porphyra hæmorrhagica* and *p. nautica*) as well; and hence are no ground whatever for establishing a distinct species, and still less a distinct genus, though they might perhaps form a variety. By most writers therefore of eminence, from Cullen to Swediaur, they are arranged and treated of as different forms of the same disease.

During the first twenty-four hours, the alternate heat and cold are considerable; the fever increases every evening, and, in the second week, the delirium usually commences; the stupor following five, six, or seven days afterward. From the first, there is a heavy and vertiginous headache and vomiting: the pain over the forehead shoots through the eyes to the bottom of the orbits; the eyes themselves are full, heavy, and slightly inflamed; the countenance is bloated; the tongue white rather than furred; the temporal arteries throb, while the pulse at the wrist is small and oppressed; the ears tingle; and the mind, antecedently to the delirium, is fearfully dejected. There is also occasionally, from the weak degree of action on the surface, a livid but interrupted turgescence over the whole of the body, as well as the face, not unlike the mottled appearance on the skin of a healthy person when exposed to a slight degree of cold. Dr. Hildenbrand has regarded this symptom as constant and pathognomonic; and has hence introduced contagious typhus into the list of exanthems, specifically distinguished by this spotted efflorescence (*Ueber der ansteckenden Typhus, von J. V. Edler von Hildenbrand*, &c., Wien, 1815), which he seems further to believe is loaded with its peculiar miasm. So far, however, as the present author has seen, it is an occasional, rather than a necessary accompaniment, and appears to be a natural result of the cause just stated. It subsides in a few days.

The balance of the sanguiferous system is generally much disturbed from a greater degree of sensorial debility in some organs than in others; and hence the blood is determined irregularly, and accumulation, effusion, and inflammation, are frequent effects. These show themselves chiefly in the head, the lungs, and the liver; but there is no organ in which they may not occur: and they never can occur without danger. All the external senses evince great hebetude, and especially the hearing, so as often to amount to absolute deafness; the stupor is increased, and the speech muddled, while the patient appears to dream without being asleep, and talks deliriously; thus evincing the typhomania of the ancients; being often unconquerably riveted to a single idea or train of ideas. And as the nervous exhaustion increases, he is indifferent to every thing, feels little or nothing, and if he answer at all to an inquiry how he is, says he is very well.

[Typhus fever affords a striking example of the vast change produced in the secretions by disease. The fact is particularly noticed by Dr. Armstrong in his description of the state of the tongue. In typhus fever, he observes, as the lips and cheeks become dusky during its perfect development, a peculiar secretion is besmeared over the tongue and fauces, almost as if the fibrine and albumen had been dissolved, so as nearly to resemble in its adhesive property common melted glue; the tongue itself, from the evaporation of the thinner portions of this secretion, becomes dry, presenting a varnished appearance, like that of a walking-stick; and at a still more advanced stage, it becomes brown, and ultimately black, from an apparently carbonaceous deposite. In some fully developed cases, where the tongue is glazed, dry, and brown, and the lips and cheeks of a dusky or purple hue, the blood drawn from the temporal artery has a venous colour. The circulation of such blood within the arteries is connected with many of the most conspicuous and curious phenomena of the advanced stage of typhus. *The cause of this remarkable change can be shown by dissection to depend upon a specific bronchitis*, the mucous texture of the bronchial tubes being loaded with dark blood, and besmeared with a copious and tenacious secretion.*]

About the thirteenth or fourteenth day, sometimes preceded by an augmented exacerbation, and sometimes without any, the fever suddenly abates, a relieving dew appears on the parched skin, and all the excretories evince the same freedom from spasmodic constriction: the tongue loses its dryness; the nostrils are moistened with mucus, and occasionally discharge blood; the lungs pour forth a free expuition, which softens the harsh glottis and the fauces; the bowels, if not loose, feel more refreshed after evacuations; and the urine is more copious,

* See Armstrong's Morbid Anatomy of the Bowels, Liver, &c., pp. 8, 14, &c., 4to., Lond., 1828. According to Dr. Burne, the blood flows slowly from divided vessels, is blacker than usual, coagulates less firmly, rarely shows the buffy coat, and in the dead body, is found black and fluid. On Typhus, or Adynamic Fever, 8vo., Lond., 1828. Dr. Clanny's observations lead to the conclusion, that the watery part of the blood increases in proportion during the progress of the fever; while the quantity of all the animal principles and salts of that fluid is lessened; and that, when the crisis has taken place, the opposite change begins, so that the blood returns to its natural condition. Supposing this statement to be correct, we must not fancy, with Dr. Clanny, that fever depends upon the derangement of sanguification, but only that the latter is one of its attendant changes.—Ed.

with an abundant deposite: and, to close the whole, in the elegant language of Professor Frank, "increscunt pulsus, mollisque unda arteriam æquali rhythmo attollit: sequuntur somni placidiores, reficientes, et oblatum ægrotus cibum minùs abhorret."—(*De Cur. Morb. Hom. Epit.*, tom. i., p. 107.)

If, however, no critical change take place about the fourteenth day, leading distinctly to an amended state, the symptoms of putridity increase both in number and degree. There is great faintness; difficulty of respiration, intermixed with deep sobs; the breath is hot and offensive; acute pains in the loins and limbs; a heat upon the skin, biting and pungent rather than burning; leaving a smarting sensation on the fingers for several minutes after touching it, and which, from this very peculiar effect, has been called *calor mordicans*. The tongue, whitish at first, is now dry, dark, livid, black, or of a pomegranate colour. The lips are furred with a black tenacious sordes; the urine becomes brown or blackish, with a most offensive smell; a blackish or bilious matter is occasionally thrown up from the stomach; the skin is more or less discoloured, as just observed, with flea-bite-shaped or broad purple spots; the stools are blackish and highly fetid. Cold, clammy, colliquative sweats and convulsions, sometimes accompanied with hemorrhage from one or more organs, soon afterward usher in death; the period of which is extremely uncertain, and ranges from the fifth to the eighteenth day, according to the malignity of the attack, the strength of the patient, or other contingent circumstances.

I have said that the milder variety or nervous fever usually shows itself sporadically, originating from some other cause than febrile miasm in an irritable and atonic habit. Malignant typhus sometimes commences in the same way, but usually by a decomposition of human effluvium accumulated in a camp, a ship, or even a large single family, where the space is too small for the number, the habits uncleanly, and the atmosphere stagnant and unventilated. The cause is one, and the fever the same, varied alone by accidental circumstances or symptoms, that depend altogether upon its less or greater degree of violence.

In this metropolis, therefore, malignant typhus is almost exclusively to be met with among the poor; and the more wretched and destitute they are, the more readily they become its prey. I cannot better illustrate its rise and progress than by the following simple picture as furnished by Dr. J. Hunter: it is drawn from life, and will be easily recognised by every practitioner.

"A poor family, consisting of the husband, the wife, and one or more children, were lodged in a small apartment, not exceeding twelve or fourteen feet in length, and as much in breadth. The support of them depended on the industry and daily labour of the husband, who, with difficulty, could earn enough to purchase food necessary for their existence, without being able to provide sufficient clothing or fuel against the inclemencies of the season. In order, therefore, to defend themselves against the cold of the winter, their small apartment was closely shut up, and the air excluded by every possible means. They did not remain long in this situation before the air became so vitiated as to affect their health, and produce a fever in some one of the miserable family. The fever was not violent at first, but generally crept on gradually; and the sickness of one of the family became an additional reason for still more effectually excluding the fresh air; and was also a means of keeping a greater proportion of the family in the apartment during the daytime; for the sick person was necessarily confined, and another as a nurse. Soon after the first, a second was seized with the fever; and, in a few days more, the whole family perhaps were attacked, one after another, with the same distemper. I have oftener than once seen four of a family ill at one time, and sometimes all lying on the same bed. The fever appeared sooner or later, as the winter was more or less inclement; as the family was greater or smaller; as they were worse or better provided with clothes for their persons and beds, and with fuel; and as their apartment was more or less confined."—(*Med. Trans.*, vol. iii., art. xxii.)

There are a few auxiliary causes not noticed in the above faithful delineation, which seldom fail of being present, and have always a very considerable degree of influence: these are, the anxiety and dejection of mind so sure to accompany such a scene of misery, and the increasing carelessness, and consequently uncleanliness of person, which are equally sure to follow. And we may hence see why typhus should so frequently make its appearance in the poorest and most miserable streets of a metropolis, and be generally confined to such streets; why it should rage most extensively and most violently in times of the severest public pressure and distress; and hence, again, why it should be more common in Ireland than in England, in Dublin than in London. We also see the inestimable advantage of such establishments as Fever Houses or Infirmaries in all populous towns, when built upon the sound principles, and governed by the judicious regulations, and, I may add, superintended by the active humanity and established talents, which are so conspicuous in the Fever Hospital of this metropolis.

To describe the typhus of jails, ships, camps, and other large bodies of men, we have only to multiply the single family we have just beheld into fifties or hundreds; ever remembering, that the virulence of the febrile poison increases in power, not in a numerical, but in a sort of geometrical proportion, to the numbers by which it is fed. So that if five patients produce a given ratio of pestilence, ten will produce, not as much again, but nearly a hundred times as much. And hence we may readily account for the fearful and deadly ravage which this cruel scourge is well known to inflict upon a people when closely pressed together, and incapable of flying from its pestilential aura, as in crowded encampments, or a besieged and pent-up town: and

especially where, as is often the case, there is considerable carnage from the casualties of war, and a deadly calm prevails for weeks together in the atmosphere. This last concomitant, indeed, gives completion to the whole, and is a heavier calamity than it is generally conceived to be; for the most fatal pestilences of which we have any account, seem to have been preceded by a stagnant atmosphere. Thus Maitland, in his History of London, observes, "that for several weeks before the plague broke out in this metropolis, in 1665, there was an uninterrupted calm, without sufficient motion in the air to turn a vane." The assertion is confirmed by Baynard, a contemporary physician; and a like harbinger, as is observed by Diemerbroeck, preceded the plague at Nimeguen.

In both varieties, the prognosis must be collected from the vehemence of the symptoms, and the character of the idiosyncrasy; and the cure must depend upon the means we may possess of supporting the vital power, and restoring its lost energy.

The peculiar properties by which typhous miasm is distinguished from miasms of every other kind, are the rapid and direct debility with which it affects the nervous system; the activity of its leaven, by which it assimilates all the fluids of the body to its own nature; and the urgent putrefactive tendency it gives to every part.

The last of these properties may, in some degree, be dependant upon the first; but it does not appear to be entirely so; since we often find the sensorial power reduced to a much lower ebb, as in asphyxy from hanging or drowning, suffocating exhalations or lightning, catalepsy, and deliquium from loss of blood, while there is an almost infinitely less degree of tendency to putrefaction. And, in like manner, although the miasms of many of the exanthems, as rosalia or scarlet fever, smallpox, and plague, are also capable of tainting the secretions of the body, none of them appear to do it so completely and universally as that of typhus when in its most malignant state; in which the breath, all the egesta, and all the fluids are loaded with contagion. It has been propagated by the excrement (*Riedlin, Lin. Med.*, 1695, p. 402), by the odour of flowers employed to decorate the dead body (*Eph. Nat. Cur. Dec.*, ann. vii., viii., obs. 193); by washing the bandages employed in typhous gangrene (*Hennen's Principles of Military Surgery*, p. 218), and, in innumerable instances, by the communication of a minute drop of any of the fluids of the dead body to a punctured finger during dissection.

In forming our prognosis, and attempting a cure, these properties should always be prominent in the mind; for they will best enable us to calculate the nature and result of symptoms that are present, and will guide us to the most rational and satisfactory mode of practice.

From the debility that prevails, even from the first, the pulse is feeble and tremulous, the extreme vessels torpid, or nearly so, and the circulatory balance greatly disturbed. Hence, we have reason to expect, that effusion and congestion, or an irregular determination of the blood, will, in many cases, be an early attendant; and, if there be energy enough remaining in the organs thus affected to produce any degree of reaction, that local reaction will follow, and perhaps lead on to inflammation terminating in suppuration or gangrene; of which Sir John Pringle has given numerous examples. And hence there is some ground for contemplating typhus, as Dr. Armstrong has done, under the three varieties of a simple, congestive, and inflammatory affection; this last being sometimes seated in one organ, and sometimes in another: most frequently, perhaps, in the brain, where Marcus supposes it to exist in every case whatever; and occasionally, perhaps, in some of the secreting membranes, through all of which, it is conceived in every instance to extend by Hildenbrand, the rete Malpighi, the membrane that lines the cavity of the nose, of the mouth and throat, the tunica arachnoides, and the mucous membranes of the stomach, intestines, and organs of urine and generation.—(*Ueber der ansteckenden Typhus*, &c., Wien, 1815.) [It is a fact now perfectly established, that, in certain forms of fever, the mucous coat of the intestines is often found in an inflamed, ulcerated, or even gangrenous state. The writings of Broussais, Andral (*Clinique Médicale*, iv. tomes, 8vo., 1823–1827), Ribes (*Anat. Pathol.*, tom. i., 8vo., 1828), and others in France, leave no doubt on this point, which has received still further illustration from the publication of Dr. Bright (*Reports*, &c., p. 178), as was noticed in the consideration of remittent fever. Besides the affection of the head and nervous system, which seems to be connected with the first impression of fever, Dr. Bright is convinced that there is a secondary state of cerebral irritation, which depends upon the mischief going on in the intestines; and this often shows itself after the fever has continued for several days, increasing with the increase of the abdominal affection, and going on till it produces that general nervous agitation with injected conjunctiva and constant delirium, which often closes the scene of life. These observations remind the editor of a fact, which, according to Dr. Ribes, has been completely established by M. Scouttetten by numerous dissections; namely, that the connexion between the intestinal canal and the pia mater is so intimate, that, when the former is affected with either acute or chronic inflammation, the latter always participates equally in the affection, with this particularity, that it only happens when the mucous membrane of the bowels is concerned, and not when the serous one alone is disordered.* An observation made

* The modern French pathologists seem to have demonstrated, by numerous examples, this important principle, that an affection of the pia mater and of the arachnoid membrane is often the consequence of an inflammation of the mucous membrane of the stomach or intestines. Dr. J. W. Francis assures us, that he has noticed the same fact in the post mortem examinations of subjects who have died from drinking cold water in the heat of summer; and particularly in those who were intemperate. A majority of the bodies dis-

by Dr. Alison rather corroborates the foregoing statement; as he notices, that, in the worst cases of remittent fever of children, the mucous membrane of the bowels is inflamed and ulcerated, and that one mode in which the case proves fatal, is by sudden conversion into an affection of the head.—(*Alison, in Edin. Med. Chir. Trans.*, vol. i., p. 433.) The researches of Dr. Bright agree with those of the French pathologists in fixing upon the mucous membrane of the ileum, cœcum, and beginning of the colon, as the principal seat of morbid alteration, though occasionally the same membrane has been inflamed and irritated throughout the whole extent of the intestinal canal. "The appearances (says Dr. Bright) which are most marked in the mucous membrane of the intestines, are those of increased action, vascularity sometimes occurring in patches of greater or less extent, without any obvious dependance on inflammation of the mucous glands, and occasionally extending, under some form or other, through the whole track from the pylorus to the rectum; but this vascularity is more generally connected with inflammation of the mucous glands, which often appear like the smallpox on the second or third day of the eruption, elevated and almost transparent, with minute vessels which dip into them from the lining membrane of the intestines. They scarcely seem to go into a state of true suppuration, but become distended with a yellow cheesy matter, and slough off; or sometimes ulceration takes place upon their points externally, without any collection of yellow matter being perceptible. The same process, or nearly so, takes place both in the solitary and in the congregate glands; except that, in the latter, the appearance becomes much more formidable, and the mischief more extensive. The masses or clusters of congregate glands, are chiefly placed along that part of the intestine which is farthest from the insertion of the mesentery; and, when the parts are irritated from disease, three, four, or five considerable branches of vessels are seen passing on the mucous membrane, from the mesentery on each side, towards the cluster of congregate glands." The glands themselves enlarge, and, after some time, form a thick, flat mass, of a lighter colour than the surrounding intestine. This sometimes increases to the thickness of a half-crown piece, and occasionally even spreads on the top, so that the surface overhangs the base nearly the sixth part of an inch. Sometimes a dark-coloured matter, like grumous blood, is deposited among the glands; so that the whole mass, instead of being lighter than the intestine, is of a brown colour, elevated evenly above the surface; but, in either case, the mucous membrane is at first only raised, and not broken. In a little time fissures are formed, and the whole mass ulcerates. When the inflammation subsides, the depth of the ulcer diminishes; and the greater part of the glandular structure being apparently removed by ulceration and sloughing, the edges fall down, and the ulcer becomes shallow, sometimes leaving the muscular fibres nicely displayed, or often exposing the internal surface of the peritoneal coat to the extent of a quarter or half of an inch square. This excavation is filled up by the process of granulation, which, Dr. Bright says, may be seen very beautifully by suspending the intestine, cut open, before a lamp or the bright sunshine, and examining it with a common lens. When the whole is healed, a scar remains visible for some time, and appears to be covered by a true mucous membrane. These ulcerations are stated to be quite analogous to those painful and irritating sores which frequently occur on the lips or lining of the cheeks. The space occupied by the ulcers in the intestines, is usually about two feet at the lower end of the ileum, and frequently the valve of the colon, on the side towards the ileum, is the part where the disease is most advanced. A few ulcers are likewise often found in the cœcum, and some are occasionally dispersed along the colon. The peritoneal coat at the back of the ulcers is generally discoloured and vascular, though seldom actually inflamed; which, however, it is sometimes, when the tenderness of the abdomen becomes more marked, and, after death, a sero-purulent effusion is found, and the convolutions glued together with threads of coagulating lymph. In a few rare cases, the ulceration extends completely through the peritoneum, the contents of the bowel becoming effused in the abdomen, followed by general inflammation of that cavity and death. Together with the foregoing changes, the mesenteric glands are usually found enlarged and vascular, particularly those which are situated opposite the intestinal ulcers, and which occasionally suppurate. In the remittent fever of scrofulous children, Dr. Alison represents the mesenteric glands next to the ulcerations of the mucous coat as being much swelled, and of a dark red colour, both externally and internally. Dr. Bright's investigations confirm the remark of the generality of modern pathologists, as Andral, Percival, Macartney, and others, that, in addition to the preceding morbid appearances of the intestinal canal in subjects destroyed by fever, other organs frequently suffer as much as the bowels, and even more, especially the brain and its membranes, in which marks of congestion are very manifest. Nor, says he, is it at all unusual to find the lungs altered, as in pneumonia, and it is even more common to find them loaded with an extraordinary quantity of blood.*

* See Bright's Reports of Medical Cases, p. 180, et seq., 4to., Lond., 1827. After noticing the tendency to an inflammatory affection of the brain, Dr. Tweedie remarks, "that of the lesions in other organs, which arise in the more severe cases of typhus fever, congestion, or inflammation of the mucous membranes, bronchial and intestinal, and inflammation of the parenchyma of organs, are the most important. The congested state of the capillaries of the mucous membranes, the blood being at the same time in a state which favours its transudation, occasionally gives rise to hæmor-

sected by Dr. F. during the last fifteen years, after death from this cause, have presented this pathological connexion between the stomach and the brain.—D.

Many of the cases in which the above morbid appearances in the bowels were observed by Dr. Bright, seem to have been of the remittent type; though others were probably typhoid, as far as can be judged from the particulars recorded. The discharge from the bowels is very often dark-coloured in typhus, but not always; and hence the circumstance of the morbid changes, pointed out by Dr. Bright, being denoted by the watery ochre-coloured appearance of the feces, must not be taken as a complete proof that none of his cases were typhoid. It merits notice, that similar alterations of the mucous membrane are particularly described by the French pathologists as occurring in typhus. This doctrine has even been carried to such a degree, that, in France, the question has been entertained, whether the ileum and the valve of the cœcum are the real seat of the disorder, characterized by symptoms usually termed putrid and typhoid? A question to which, as Dr. Ribes properly observes, a negative answer must be decidedly returned; because some facts prove that typhus fever may be quite unattended with any of the foregoing morbid appearances in the ileum and valve of the cœcum, and the symptoms be connected with traces of organic disease in the stomach.* We have seen also, that inflammation and ulceration of the mucous coat of the bowels prevail in remittent and other fevers, which are quite different from typhus.]

It should never be forgotten, that typhus in every stage and variety is one and the same, a disease of sensorial debility; and that our only hope of cure depends on economizing the nervous power that remains, supporting it as far as we are able without farther loss, and opposing the natural tendency of the disease by such tonics as the system will best bear.

On this account, whatever tends to weaken the animal frame generally, or any one of its functions particularly, must, as a common rule, be carefully abstained from; and hence severe evacuations, by bleeding† or purging, are among the foremost objects of prohibition.

The bowels, indeed, ought by all means to be moved by a gentle aperient; but beyond this we ought not to proceed, as we shall add to the debility, without obtaining any correspondent advantage. The grateful acids of tamarinds, cream of tartar, or prunes, are preferable, if found sufficiently powerful; but, if not, they should be combined with rhubarb or senna.* And, as the stomach is less irritable than in yellow fever, an emetic may be given whenever indicated; but, unless there be a troublesome nausea, even this had better be avoided. Ipecacuanha will answer better than antimonial preparations, and the evacuation should be followed with a cordial draught.

[On this part of the subject, the following observations, delivered by Dr. Bateman, seem judicious. The first object is to arrest the febrile affection, if possible, in its very commencement, by means capable of exciting a kind of shock in the system. The two most efficacious remedies of this nature are emetics and the affusion of cold water on the skin. The first has this advantage, that it may be employed in the very onset of the fever, during the presence of the rigours; while the second, although perhaps more powerful, is inadmissible until the hot stage be completely formed. If an active emetic be given during the chills, and a free vomiting be excited, the cold fit is often speedily terminated, and a general glow, accompanied with a degree of perspiration, is produced. Or, if the emetic be delayed until the hot fit has commenced, its operation is frequently followed by

rhage from different parts, more frequently, however, from the bowels than from either the nose, lungs, or any other cavity; and, when the hemorrhage is excessive, the already exhausted powers of the patient are often irrecoverably sunk. A similar hemorrhagic action is not unfrequently manifested in the skin, in the form of small red spots (petechiæ), or more extensive patches, termed *vibices*. In cases of still greater malignity, carbuncles, gangrenous inflammation of the skin, painful swellings of the lymphatic glands, and, in some seasons, especially in hospitals, erysipelas may arise."—See Tweedie on Continued Fever, p. 80.—Ed.

* Anatomie Pathologique considérée dans ses vrais rapports avec la Science des Maladies, p. 102, tom. i., 8vo., Paris, 1828. A further refutation of this doctrine is contained in the writings of Laennec, and in Burne's Practical Treatise on Typhus, 8vo., Lond., 1828.

† This doctrine should be qualified. "In the milder cases of typhus fever, bloodletting is seldom necessary, and may in general be dispensed with, unless some special circumstance arise to render it expedient; such as severe pain, or sense of weight in the head, flushing, intolerance of light, hot skin, and other symptoms, denoting a more intense form of fever. With such symptoms, the abstraction of a moderate quantity of blood, especially if the patient be young, or of a full habit, will be proper. If, however, the pulse, though rapid, be soft and compressible, the tongue begin early to assume a brown teint, and there be considerable prostration, the loss of blood cannot be sustained."—See Tweedie on Continued Fever, p. 210.—Ed.

* On account of the greater tendency to inflammation of the mucous membrane and follicles of the intestines in typhus, Dr. Tweedie thinks that every source of irritation, and, consequently, the stimulus of cathartics, should, as much as possible, be avoided. "If these precautions as to bleeding and purging are necessary in the early stage, they are more especially so in the advanced; at which period such aperients as remove unhealthy secretions without producing watery stools are to be employed, viz., rhubarb, magnesia, or castor-oil, with occasional doses of mercurials. It is necessary to examine daily the evacuations from the bowels in typhus fever. Bloody diarrhœa is always a most alarming symptom in fever, showing a malignant form of the disease. It depends on a loaded state of the capillaries of the mucous membrane. The congestion of the mucous membrane, and consequent hemorrhage, may take place without ulceration; but, when there is ulceration, the blood does not proceed from the open surface, but by capillary exudation. This symptom is best managed by suspending all irritating medicines, and administering occasional doses of superacetate of lead and opium."—See Tweedie on Continued Fever, p. 213.—Ed.

a free perspiration, as well as a relief of every symptom.*]

But congestion, as already observed, may take place, and this too in the larger and more important organs of the animal frame, as the head, the lungs, or the liver.† If in the first, there will be a sense of oppression in the brain, most commonly combined with stupor, or low muttering delirium; if in the second, a laborious weight on the chest and a difficulty of respiration; if in the third, the bowels will usually be found costive, the motions pale and argillaceous, and sometimes the skin and the urine chlorotic, or of a greenish yellow, from a regurgitation of morbid bile into the sanguineous system. Hence the fever will be aggravated from local irritation, and the affected organ will be in danger of inflammation, if not of gangrene.

Is the general rule in this case to be departed from? is blood to be taken from the system? and if so, is it to be drawn locally or generally? and to what amount?‡

We have here only left to us a choice of difficulties. Nothing, as Dr. Fordyce has justly observed, is more dangerous in any fever, than its affecting one part more than another; but in typhus the danger is extreme, and must be combated boldly and rapidly by whatever plan has a chance of taking it off, and however hazardous in itself, provided the hazard be less than that of the disease. And hence in this case, bleeding must be had recourse to, for there is nothing we can so well depend upon. If we have reason to believe that the overloaded organ is without inflammation, the blood should be drawn locally and till relief is afforded; if there be good ground for suspecting that inflammation has commenced, and especially if the organ affected be large and important, it will be better to employ the lancet; and it cannot be employed too soon, nor ought it to be relinquished till it has attained its object.—(*J. P Frank, De Cur. Hom. Morb. Epit.*, tom. i., p 136.) There is a risk in the practice; but there is death without it. Fainting may perhaps take place in the midst of the operation; but this is rather to be wished for than guarded against; for the exhaustion of sensorial power produced by deliquium, bears no comparison to that produced by the influence of the typhous miasm.

The following remarks of Dr. Baillie upon this subject, as indeed upon most others, are peculiarly important; and the more so from the modesty with which they are given, and the striking proof of the candour which so particularly distinguished this great and experienced man. It is thus he writes, towards the close of his active and honourable career:—"During the greater part of the time in which I have practised medicine, physicians in general, and myself among that number, have, I believe, been too sparing in taking away blood in typhus fever. It was hardly ever directed to be taken away from the arm, and not often locally, except by the application of leeches to the head. Of late years many physicians have gone into the opposite extreme, and have taken away blood too profusely. In the course of a few years, this remedy, like every other, will find its proper level."*

In the above state of the disease, namely, that combined with visceral congestions also, instead of merely keeping the bowels open, we should employ purgatives that will maintain a stimulating effect upon the whole of the intestinal canal, so that three, or even four evacuations may be obtained daily; and calomel will be commonly the best medicine for this purpose. [When the symptoms indicate irritation and ulceration of the mucous membrane of the bowels, Dr. Bright prescribes the hydrargyrum cum cretâ, and the compound chalk powder, with or without ipecacuanha; and if the alvine evacuations are too scanty, he gives castor-oil with a few drops of laudanum. This, with fomentations, leeches, and cupping of the abdomen, according to circumstances, is the practice from which he has seen the greatest benefit result, where fevers are attended with the complication of diseased mucous membrane of the bowels.†]

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* Bateman, in Rees's Cyclopædia, art. FEVER. Although Dr. Elliotson approves of giving an emetic in the beginning, yet, if there were tenderness of the epigastrium, or tenderness on making pressure on any part of the abdomen, he would not have recourse to such measure. Also, if there were violent determination of blood to the head, he would not recommend it. If this symptom existed, together with a full pulse, he would first bleed the patient.—Lectures at Lond. Univ., pub. in Med. Gaz., 1832, p. 183.—ED.

† For further information respecting the state of these organs, see Dr. E. Percival on the Epidemic Fevers of Dublin in 1813, 1814, and 1815; in Dublin Hospital Reports, vol. i., p. 304, &c. Also, Dissections by Dr. Macartney, recorded by Dr. Barker, in Trans. of King's and Queen's College of Physicians, vol. ii., p. 574, et seq.—ED.

‡ As Professor Elliotson observes, "it is necessary, in every case of fever, to be constantly on the look-out for local inflammation; every day to ascertain what is the state of the affection of the head, of the affection of the chest, and of the affection of the abdomen. You should always ask if the patient complains of headache; you should look at his eyes, and see whether they be red or not; ascertain if his pulse be full, and inquire whether there be any throbbing of the head. So, with respect to the chest, you should observe whether there is difficulty of breathing, and if there be, it is well to apply the stethoscope, and ascertain what rattling there is. The abdomen ought to be carefully felt every day, to see whether the stomach, intestines, liver, peritoneum, or other parts, are inflamed. When we find a sufficient degree of inflammatory disturbance of these parts, then it is right to take away blood locally."—Lectures at the London University, pub. in Med. Gaz., 1832, p. 210.

* Lectures and Observations on Medicine, by the late Matthew Baillie, M. D., 8vo., 1825, unpublished; printed by Taylor.

† See Bright's Reports of Medical Cases, p. 184, 4to., Lond., 1827. The following is the advice delivered by Professor Elliotson:—"If there be vomiting, or tenderness at the epigastrium without it, you should apply leeches there, which are the best remedy for it; because, when there

Such are the exceptions, and the only ones we should allow to the general rule of opposing the disease, by economizing, supporting, and restoring the depressed tone of the nervous system. But there are pathologists, and of considerable authority, who recommend bleeding, and even full bleeding, in almost every instance of the disease, as the first step to be pursued: thus inverting the mode of practice here laid down, and taking the exceptions for the rule, and the rule for the exceptions.

The theory of this recommendation is but of little importance, provided it be justified by its result. At the same time, I cannot avoid observing, that its chief advocates have not been able to bring themselves to any thing like a common theory, or to support their recommendation upon common principles; than which nothing can be more unfavourable to the reception of a doctrine, or more hostile to its scientific pretensions. Typhus is, by Dr. Clutterbuck, regarded, like every other kind of fever, as the result of an inflammation of the brain; and bloodletting is here grounded upon the principle of attacking the cerebral inflammation, and *debilitating* the action of the living fibre. The visceral and other local congestions and inflammations that so often occur, are, by Dr. Armstrong (*Practical Illustrations of Typhus*, &c., 8vo.), regarded as precursive and generative of the sensorial debility, while the disease itself is no more derived from the brain than from any other organ. And bloodletting, under this view of the subject, is recommended as the means of *preventing* debility in the living fibre, instead of *adding* to it. "We may perhaps find," says he, "sufficient data for concluding that the nervous appearances, even from the very first attack, are only secondary of vascular disorder." Now, these hypotheses, discrepant as they are from each other, may be both founded upon a mistake of the effect for the cause.—(*Appendix to his Remarks on the Constitution of the Medical Department*, &c.) And such, indeed, seems to be the general opinion of pathologists upon the subject; and hence, even admitting the benefit of bloodletting as an invariable or common rule, we have yet to search for *some other reason* by which such benefit is to be explained. Dr. Jackson thought he had found this reason in the *stimulant* effect of venesection upon the system at large, which, by exciting new motions, suspends or changes morbid motions, and affords room for the vires medicatrices naturæ to act with a more salutary power; while, by its mechanical effect in diminishing the circulating fluid, it adapts the moles movenda to the vis movens. Venesection, therefore, upon Dr. Jackson's hypothesis, acts not by debilitating, or even preventing debility, but directly by *invigorating* the living fibre; and in this view he employed it in fevers of every kind, entonic and atonic, inflammatory and putrid, and, in his own belief, with nearly equal success.

But this is to regard the blood as an encumbrance, a dead and foreign body in its own vessels, instead of as a living and nutrient principle; the removal of which affords ease and freedom to every part of the animal frame, and clears it for the contest in which it is about to engage. A violent and general commotion, produced in the system from severe bleeding, or any other cause, cannot fail of exciting a very deep impression upon every part; and has often suspended or changed the actual train of motions, and introduced a new train in its stead; and, in various instances, the change has unquestionably been beneficial, and even salutary. This is particularly the case in sudden and overwhelming excitements of mental emotion, which have, sometimes, abruptly cut short the career of fevers as well as of various other complaints; of which the Baron Van Swieten gives a striking instance in a man, who, while labouring under a continued fever, with delirium, was so alarmed at the terrific aspect of a person that burst suddenly into the sick room, vociferating that the house was on fire, which in this case was the fact, that he rose without help from his bed, ran out of the house with all speed, and was well from that moment. To this principle of salutary change of action, excited by a violent and general commotion throughout the system, it is probable, that we are to ascribe the occasional benefit that has followed upon draining the vessels of blood in diabetes, and even in lyssa, or canine madness. And it is possible, therefore, that copious venesection may, also, in many instances, have cut short the attack of typhus, and thus proved a rapid and effectual remedy. But, if this be the ground upon which it acts, few practitioners would be disposed to recommend it; while, if it be not, we have no other ground that will furnish us with a satisfactory explanation.

In the commotion which takes place from copious venesection, it should moreover be observed, that there are often local determinations of other kinds or to other organs; for, the more we lessen the general strength, the more we make an inroad upon the instinctive power of preserving a balance in the circulating system; and as these new determinations are almost uniformly accompanied with an apparent, though a deceptive, increase of force, as well as of fulness in the pulse, and other symptoms of great violence of action, the friend to phlebotomy is too often stimulated to an exercise of his lancet through several times in succession, still wondering at the perversity of an action, whose mischievous, and, it may be, fatal

is tenderness or vomiting, it generally arises from inflammation of the mucous membrane, and leeches will remove it by removing the causes of inflammation. So, with regard to the abdomen at large, when that is tender, there is generally more or less diarrhœa; the intestines are acting too violently, and leeches, freely applied, are the best mode of restraining it. After they have been applied, you may employ a blister; but you should always remember that a blister will not answer as a substitute for local bleeding, if the inflammation be considerable."—Lectures delivered at Lond. Univ., and published in Med. Gazette, 1832, p. 211.—Ed.

perseverance, is only maintained by his own exertions. The following remark of Dr. Pring is, upon this subject, of great value, as well as perfectly correct:—"It is commonly, and in my own experience it has been invariably, the case, that those who have sustained great losses of blood, suffer more or less from what is called determination to the head. The symptoms most commonly are, intense pain and throbbing in the forehead or back part of the head, with a pulse seldom under 90. I have known these symptoms to proceed on, with a pulse from 120 to 140, to delirium, apoplexy, and death."—(*Principles of Pathology*, &c., *by Daniel Pring, M. D.*, 8vo., 1823.)

But the author has observed, that the theory is of little importance, provided the practice has justified itself by the event. How then stands the sum of general opinion upon this subject, even apart from such occasional fatalities? The practice is by no means new, though ordinarily supposed to be of recent origin; for it has alternately lived and died away, been revived and again sunk into disrepute, for considerably upwards of three centuries; and its advocates have, in various times, been as numerous and as confident, and have maintained as warm a contest, as we are called upon to witness at present: of which any one may convince himself who will turn to the books referred to in proof of this assertion, at the foot of the page;* of which the first three were published in the sixteenth century, the ensuing two in the seventeenth, and the last two in the middle of the eighteenth. Professor De Büchner, of Halle, was strenuously opposed in his recommendation of venesection, at Paris, by Chambon de Montaux, and at Rome, by Sinibaldi. Yet, as in the present day, the supporters of the depleting system had also not a few controversies among themselves, though they were not precisely of the same description as those in our own time; the chief point of dispute being the part of the body from which blood could be drawn with most advantage; some practitioners performing on the arm, and others on the leg or foot; a point, however, that gradually lost its importance, as the doctrine of the circulation of the blood became more generally adopted and understood. It is not a little singular, nevertheless, that Dr. Marcus, who is entitled to the distinction, if not of reviving the plan of sanguineous evacuation in the present day, at least of carrying it to a more daring extreme than any other practitioner, and of stamping its general use with all the weight of his authority, was, only a few years before the publication of his "Special Therapeutics," in which the advantages of bold depletion were first triumphantly promulgated, one of the most ardent disciples of Dr. Brown of Edinburgh, and consequently one of the warmest advocates for the opposite system of cordials and stimulation.

Judging, therefore, of the expediency of bloodletting, from the history of the practice before us, when enforced as a general rule in typhus, the sum of medical opinion upon a trial of three centuries is against it. The practice has occasionally started into popularity; but it has never been able to establish itself. In the peculiar states of the disease I have already adverted to, it may be useful, and ought not indeed to be neglected: but every case must speak for itself, and the rule must not be confounded with the exceptions. And such, in effect, was the opinion of Dr. Gilchrist, as expressed in his treatise on Nervous Fevers, published seventy years ago, in which he tells us that, at that period, "the ordinary evacuations in the beginning were bleeding and vomiting," and that it was sometimes "necessary to bleed once and again, by which the symptoms were considerably lessened."—(*Edin. Med. Essays*, vol. iv., p. 281.) But he had too much good sense to enforce this practice indiscriminately, and felt the necessity of yielding to contingencies; for, in many instances, he adds, "though we bleed, the symptoms are not always much abated by it; and if we bleed freely, being deceived by an appearance of plethora, we do harm: indeed, in general," continues he, "I imagine bleeding seldom did much good; and if great caution were not used, I suspect it was hurtful: but as I was not often called in the beginning, I am unwilling to pronounce positively about it." The passage is well worthy of attention, as containing the free opinion of an able, candid, and distinguished writer upon an extensive examination of the subject in his own day: and an opinion, too, which is very considerably in accordance with the opinion and practice of Sir John Pringle and Dr. Huxham, and still more lately of Professor Hildenbrand who is well known to be one of the most extensive practitioners in the disease before us, as well as one of the most able writers upon it in the present day.

The fact is, that action has too generally been mistaken for energy, than which, a more fatal error can never be committed. The immediate effect of profuse or repeated bleeding is exhaustion; but this effect shows itself in very different ways in different constitutions or idiosyncrasies, the principle of which the reader will find explained under the subject of syncope. While this exhaustion continues, there is a diminution of action of every kind, morbid as well as natural, and hence an imposing appearance of relief to the symptoms of the disease; but it no sooner takes place than an instinctive effort is made, the vis medicatrix naturæ, to remedy the evil hereby produced, and to restore the system to its former balance of power. This effort is called a rallying or reaction of the living principle. The arteries contract, to adapt themselves to the measure of blood that remains; the sensorial organ is roused to the secretion of a

* Bernardi Caxanes, De Ratione mittendi sanguinem in Febribus putridis, Barcelon., 1592; Sylvaticus, De secandâ in putridis Febribus venâ quam Salvatellam dicunt, 1583; Turini, An in omni Febre putridâ compatet phlebotomia? Rem., 1545; Nigrisoli, Progymnasma de venâ in Febre malignâ secandâ? an superiori an inferiori? Guastalla, 1665; Suavalla, Ergo malignæ febri venesectio? Paris, 1694; De Büchner, Diss. de Venesectione in febris acutis malignis, Halle, 1757; Gilchrist, Edin. Med. Essays, vol. iv., art. xxiii.

larger proportion of nervous power to supply the inordinate drain that takes place during the general commotion, all is in a state of temporary hurry and urgency, and for the most part irregularity of action, while the instinctive effort is proceeding. And hence, no sooner is the immediate effect of prostration, exhaustion, or syncope overcome, than the heart palpitates, the pulse beats forcibly with a jerking bound, the head throbs, the eyes flash fire, and the ears ring with unusual sounds. Now, it often happens, that these concurrent signs are mistaken for proofs of latent or increased vigour, instead of being merely proofs of increased action; and action too, that adds as largely to the exhaustion as the depletion that produced it: and the unhappy patient is bled a second, a third, or even a fourth time, till no such reaction follows; at which time it is strangely supposed that the entony, plethora, or inflammatory diathesis, is subdued and lulled into a calm, because the patient has been so far and so fatally drained of his living principle that there is no longer any rallying or reactive power remaining; and gives up the ghost, in a few hours, to the treatment, instead of to the disease.

There is a valuable paper upon this subject from the pen of Dr. Marshall Hall, in a late volume of the Transactions of the Medico-Chirurgical Society (vol. xiii., part i., p. 140), which should be read by every one before he ventures to employ his lancet in the case before us. "The symptoms of exhaustion," says he, "with reaction, have, I am persuaded, frequently been mistaken for those of INFLAMMATION, or other DISEASE OF THE HEAD OR HEART. Under this impression, recourse has frequently been had to the further detraction of blood by the lancet; and the effect of this practice is such as greatly to impose upon the inexperienced, for all the symptoms are perhaps fully relieved. It was some time before I could fully comprehend the nature of this fact. I had satisfied myself that, in certain cases, the symptoms were those of loss of blood, and yet it appeared to me no less certain that those very symptoms were relieved by the lancet. At length I discovered, by careful observation, that the symptoms which were relieved were those of reaction, and the mode of relief the substance of syncope; that the relief endured as long as this state of faintishness continued, but returned as this state gave way to the rallying and reaction of the vital powers.

It should never be forgotten, however, that the expediency of bleeding must depend, not only on the diathesis of the individual, but very considerably on the state of the atmosphere. This remark I wish to enforce very strongly on the attention of practitioners, as it is derived from experience, and is of more importance than it may at first appear to be. As inflammatory fever has sometimes a tendency, from peculiarity of constitution or accidental circumstances, to run rapidly into typhus, typhus, in like manner, occasionally meets with incidents that suddenly reverse its character, and incline it to an inflammatory type. A very stimulant plan of treatment has sometimes done this; but far more frequently, a sudden change in the atmosphere, from hot, hazy, and relaxing weather, with scarcely a breath of air stirring abroad, to a dry, cool, and refreshing east or northeast breeze: and I have often found a like tonic effect produced upon a patient labouring under typhus in a low, damp, filthy, and suffocating lodging, upon his being removed into a large, cool, pure, and well-ventilated chamber, such as is now generally found in our fever institutions. In this case, bleeding, which I had not dared to risk, notwithstanding some symptoms of oppression, before the removal, has been practicable without any risk afterward, and has laid the foundation of a speedy and effectual cure; and I am inclined to think, that some part of the clash of opinion which prevails upon this subject in the present day, proceeds from a want of due attention to the different states in which different, or even the same patients, are placed by this difference in the purity and temperature of the surrounding atmosphere; and that many hospital physicians, who are the warmest advocates for sanguineous depletion in their own fresh, cool, airy wards, would hesitate upon its expediency if they were to attend their patients throughout in their own close, heated, and miserable habitations.

[This accords with Dr. Alison's experience, who remarks, that "there is probably less typhoid tendency in the earlier stages, and more demand for evacuations in the hospitals, than in the houses of the poor."—(*Edin. Med. Journ.*, No. xciii., p. 250.) The ill effects, however, which this able physician imputes to the removal of patients in the second week of the disease into a pure cool air, seem to the editor more justly ascribable to the disturbance of such removal than to the altered quality of the air itself. That great and decided benefit does result from the timely removal of the patient out of a bad atmosphere, is proved by the valuable testimony of Dr. Bateman, who "frequently experienced the great and obvious benefit of a cool and well-ventilated room, independently of medicine. He has visited patients who had applied for admission into the House of Recovery, in their own close and suffocating apartments, and found them in a state of delirium, with dry, black tongue, great heat, and other bad symptoms. Having directed them to be removed to the house, he has found them cool and perfectly collected, with other symptoms of equal amendment, on the following morning, from the mere influence of a cool bed and an airy apartment."—(*Art. Fever; Rees's Cyclopædia.*) No doubt, however, Dr. Alison's opinion on the disadvantage of removing the patient in a late stage is perfectly well founded, as the editor has had many opportunities of learning from experience.]

Upon the subject of bleeding, there is a passage in Dr. Hennen's Military Surgery so strikingly in point, that I cannot avoid quoting it. After the famous battle of Vittoria, in July, 1813, the sick and wounded of the British and Portuguese army were chiefly removed to a temporary hospital established at Bilboa; where,

typhous miasm having soon been produced by its ordinary causes, viz., a foul and stagnant atmosphere, crowded wards, and depressed spirits, the sick were soon affected, and, whatever was the nature of the individual constitution, the wounds of all of them ran rapidly into a typhous gangrene; "exhibiting," says Dr. Hennen, "one of the most subtile and destructive poisons that ever infested an hospital, attacking equally the most robust and the most debilitated, and, if unchecked by medical aid, proceeding invariably to a fatal termination."—(*Principles of Military Surgery*, p. 19.) "The atmosphere was, at this time, sultry and relaxing, and greatly contributed to the general debility. "I need scarcely say," continues Dr. Hennen (p. 223), "that a remedy so strongly recommended as venesection had early occupied our attention; but, previous to the month of October, the obviously typhoid type of the disease made us extremely averse from employing it. At that period, however, a change in the weather from sultry to cold, and even frost (at night) took place, marked by a corresponding change in the thermometer, which, at its medium range, was 20° lower than in the preceding month. But what more than all convinced us of the change of type, and pressed on our consideration the propriety of bloodletting, was, that the spontaneous hemorrhages, which formerly sunk the patient's strength, were now accompanied with obvious relief." And he proceeds to state, that, from this time, the practice of venesection, on the appearance of inflammatory symptoms in a wound or newly-healed stump, became general, and was the only remedy had recourse to, whether as a cure or a preventive.

Of such importance is it for us to be guided by particular and general circumstances in the treatment, not merely of typhus, but of all diseases whatever: to let the rule have its exceptions, but not to mistake the exceptions for the rule. "The art of physic," says Sir George Baker (*Med. Trans.*, vol. iii., 417), "rarely admits of any perpetual precepts; and the best medicine may do harm, if not adapted to the patient as well as to the disease."

There is another remedy of very extensive use in the cure of typhus, far less disputable, and which is founded altogether upon the indication of equalizing, supporting, and restoring the sensorial power, and that is, the free application of cold water, and especially externally.

This valuable medicament has been employed in some form or other almost immemorially. Hippocrates recommends it in malignant fevers, generally in the form of epithems, or napkins wetted with cold water, and applied repeatedly to the head, or any other viscus, as the cloths become warm.—(Περὶ Νουσῶν, ii., p. 484, 50.) Among the later Greeks however, it does not appear to have been in very general use; and, though it is highly prized by Celsus, in various debilities, and especially sensorial debility affecting the head, and combined with fever, in which, says he (*Medicinæ*, lib. iii., sect. xx.), "existat validissimè repentè aqua frigida infusa," yet it does not seem to have constituted a fixed, or even a frequent practice in his day. In our own country, it was successfully employed by Dr. Willis in various fevers, and especially those accompanied with delirium; and was hence strongly recommended by Sir J. Floyer and Dr. Baynard: and was used on the continent not merely in the form of epithems (*Mursinna über Ruhr und Faulfieber; Loeffler, Beyträge*, &c.) and affusions, but occasionally in that of immersion, or cold bathing in a river adjoining the patient.—(*Eph. Nat. Cur. Dec.*, iii., ann. iii., obs. 48, and ann. v., vi., app., p. 128.)

On the continent, indeed, it seems to have been employed at a much earlier period than in our own country, as we learn from Milot's Dissertation, "Ergo febris frigidis et humidis expugnenda?" printed at Paris in 1594; and Hernault's, on the same subject, "Ergo propria febrium medela refrigeratio?" printed in the same place in 1630. It was also used internally as well as externally, both in our own country as well as on the continent, especially in Spain and Naples, as is obvious from Dr. Hancock's Febrifugum magnum,* and Dr. Cyrillo's paper on the subject in the Philosophical Transactions. Even snow, or snow water, under the name of aqua nivata, or aqua nive refrigerata, was also occasionally employed (*Nouvelles Annales de Médecine*, iv.), and, in the ardent fever, recommended by Paullini, both externally and internally.† Professor Hildenbrand, of Vienna, during the extensive range of practice which the Austrian army afforded him in the late war, employed sometimes the cold bath, sometimes affusion of cold water, and sometimes a general friction of the surface with snow itself in the commencement of the fever. —(*Ueber den ansteckenden Typhus*, &c., ut suprà, Wien, 1815.) And, to prove how torpid to common impressions the body is under nervous fevers generally, and how little disposed to be injured by such applications, it is only necessary to advert to the case of a patient at Lucca, given by Dr. J. Benevuti, in another part of the Transactions just referred to. On the ninth and tenth day from the incursion of a malignant fever, he was thought to be in great danger. On the eleventh, he expressed a wish to go to sleep, and desired the attendants to withdraw. On their return, he was found to have left his bed; and, three days afterward, was discovered in a hut in a vineyard, about two miles from the house, having but just recovered his senses, and as much wondering how he came there as those who had traced him out. It appeared, on farther inquiry, that he had descended from his chamber by the window, in his shirt

* Febrifugum magnum; or common Water the best Cure for Fevers. Lond., 1752. The editor saw many fevers in the Military Hospital at Canterbury, in 1813, treated entirely by sponging the body with cold water, and making the patient drink copiously of the same cheap article. The success of the plan was considerable.—ED.

† Cent. i., obs. 66. See also Nehemias (Abrah.) De tempore aquæ frigidæ in febribus ardentibus ad satietatem exhibendæ, 8vo., Venet., 1591; Planchon., Journ. de Méd., tom. xxx., p. 127; Lamarque, id., tom. lxvi., p. 460, lxvii., p. 68

alone, and in a great perspiration; had walked all the way in the snow with which the ground was then covered, and had swallowed a large quantity of it to quench his thirst. Yet neither the cold air, nor cold beverage, affected him otherwise than beneficially. He continued well from this time.—(*Phil. Trans.*, vol. viii., 1768.)

The use of cold water, however, as well external as internal, appears on many occasions to have been employed with too little caution; and hence one reason of its falling into frequent disrepute. Even as early as 1581, Masini thought it right to guard the profession against its abuse, by a work expressly devoted to this subject (*De Gelidi Potûs abusu.*, 4to., Cesen.); and numerous others occurred in succession through the ensuing century.

In our own day, Dr. Wright, of Jamaica, is perhaps the first physician who revived the practice; but it is chiefly to the judgment and experience, the writings and recommendation of Dr. Currie, of Liverpool, that cold water, as an external application, is indebted for the high and deserved degree of popularity it again possesses, and especially in typhus.

It is now equally used in the form of sponging, ablution, and affusion, the last of which is the καταχύσεις of the Greek writers, though this term sometimes also imported immersion. All these are of essential use; yet the most sudden and decisive benefit has been observed to result from affusion; for which purpose the patient is to be supported on a stool in a low wide tub, and to have a small bucket of water, containing about two gallons, poured briskly on his head, and repeated four or five times in the course of the twenty-four hours, when the surface of the body is hot and without perspiration. In many cases, this plan alone has proved successful, and the fever has been cut short in a day or two from its commencement. But the method is too violent and exhausting to be employed after the first three or four days of attack; after which it will generally be most useful to restrain ourselves to epithems about or all over the head, the hair being removed for this purpose, or to sponge the body generally: and if the sensorial debility be extreme, we should prefer tepid to cold water, or mix with the cold water a little brandy or other spirit. When this method succeeds, the usual salutary effects are, a considerable diminution in the number of the pulse; diminution of heat and headache; natural sleep, and a breathing perspiration.

It does not appear to me that the principle has yet been fully explained, by which the external application of cold water becomes thus unequivocally beneficial. This is generally referred to its tonic power in exciting a reaction as the result of its chill. But though affusion often produces not only a chill, but even horripilation, sponging the body with tepid or even with cold water produces no chill of any kind; and there are many cases of extreme debility in which, if a chill were to take place, it would be most mischievous, and certainly would not be succeeded by any heat or reaction whatever. Independently of which, the refreshment takes place too speedily for such an effect, and is of a different and more tranquillizing kind, than the excitement which follows upon the chill of cold bathing in a state of health.

Upon internal medicines we can place but little dependance, except where they have pretensions to a tonic power, are moderately cardiac, or tend to equalize the nervous influence or circulating fluid.

The chief tonics in use among the Boerhaavians, were the serpentaria and contrayerva, on account of their systematic objection to the bark. The tonic power of these, however, is but feeble; by their stimulant property, they sometimes prove diaphoretic: but even as cardiacs their place is better supplied by other medicines; and in proportion as the bark has established itself, they have gradually fallen into disrepute. Yet even this last seems to be following the same track in the opinion of some practitioners of the present day, who have withdrawn all confidence in it, and undertake to affirm that it has done more mischief than good. But this is strangely to set aside the wisdom of former times, and to misconstrue the train of phenomena before them. Bark, like every other medicine, is necessarily injurious when injudiciously made use of; but there are few if any medicines of more importance, even in typhus, when there is a fit opportunity for employing it. Where the stomach is irritable, and will not retain it, or so feeble in its secernent power as not to digest it, and particularly where there is a tendency to local accumulations, it ought unquestionably to be avoided, till these symptoms are subdued by other means. But, where there are no such objections, it cannot be begun too soon, though it should not be pressed in such large doses as in the more rapid course of yellow fever. And where the bark cannot be made to sit easy on the stomach, its place may be well supplied with columba, either in powder or infusion. I need not add, that the sulphate of quinine is its best form.*

* Dr. Cullen lays it down as a rule, that whenever bloodletting is proper in continued fever, bark is prejudicial. Dr. Bateman, in the early part of his practice, used to prescribe cinchona on the first appearance of languor and debility; and he followed this method till he was convinced that it had pernicious effects, rendering the tongue dry and brown, the pulse harder and quicker, the skin hotter and more parched, &c. Hence, he nearly abandoned bark altogether. Dr. Tweedie also deems this medicine hurtful in the early stage of epidemic fever, and, when the symptoms of fever have completely subsided, he considers no tonic or stimulating treatment necessary, unless the patient be much enfeebled, and the recovery of the strength slow. But he holds its exhibition in the early stages of fever, under any circumstances, improper, as tending to keep up or increase the febrile action; and, when there is local complication, he sets it down as still more improper. "When the fever is of the typhoid form, and the symptoms, as the disease advances, denote failure of the powers, more particularly if the pulse become soft and compressible, the skin covered with petechiæ, and there be tendency to

If the skin be greatly heated and dry, either of these medicines may be combined with nitrate of potash, or a solution of the acetate of ammonia; and if the prostration of strength be considerable, we may employ camphire or wine in conjunction with tonics.

Camphire has, indeed, been united with medicines of very different powers; as with large doses of nitrate of potash, or nitrate of potash and calomel, which was at one time a favourite practice in Germany (*Abhandl. von der Wirkungen des Camphors und Calomels in anhaltenden Fiebern*); or, which is far better, with cinchona, a combination peculiarly recommended by Lasonne as increasing the energy of each, in which opinion he is joined by Dr. Cullen. Camphire, however, is in itself a highly valuable medicine on the present occasion, and cannot well be given too soon. It calms the low delirium, produces a genial glow on the surface, and seems to act as a steady permanent cordial. It was chiefly trusted to by Professor Hildenbrand during the late war, though he often united it with arnica; and, believing that no practice whatever could shorten the natural course of the disease, endeavoured to sustain the system by these remedies almost exclusively.

Acids, indeed, of all kinds, and acidulous drinks, are of great benefit in typhus. They allay the heat, tranquillize the restlessness, support the strength, and oppose the tendency to putrescence. The muriatic was preferred by Sir William Fordyce, but the sulphuric appears to be equally efficacious, and is much pleasanter.

The best cordial is wine, and it must be given in proportion as the living power flags. We must be cautious, however, in first administering it; for its very stimulus produces exhaustion, and, consequently, increased torpitude: and we should invariably recollect, that, when we have once commenced with its use, we can never leave it off; and should hence begin with such doses only as may be safely persevered in, or even increased if necessary.

Under the influence of Dr. Brown's name, both wine and spirits were lately given in enormous quantities; and it is possible, that, in a few instances, the practice may have been successful; but the risk is great and empirical; yet the practice is by no means of so late an origin as Dr. Brown's name would incline us to believe: for Borelli, Chambon de Montaux, and Reidlin, gave it quite as largely, and at least with as much success. Borelli prescribed it in injections (Cent. i., obs. 55); Reidlin assures us, that he cured a patient by administering a large dose of spirit of wine (*Lin. Med.*, 1695, p. 220), upon which Brown does not appear to have ventured; and we are told by another writer, long before Dr. Brown's time, that he completely succeeded in conquering a typhus by making his patient drink wine to ebriety on a critical day.*

Opium appears to be of less service in typhus, than in many other species of fever, and by no means entitled to the unmeasured eulogy bestowed upon it by Dr. Home, who contended, that, in every case of typhus, it was the most useful medicine; that it procures rest without any inconvenience; and that it is more to be depended upon than camphire, castor, the sedative salt of Homberg, or any other medicine of the same class.—(*Clinical Experiments, Histories, and Dissections*, 8vo., Edin., 1780.) It is best given in combination with camphire; and there is ground for the assertion of Lasonne and Hall, that, thus united, it produces less confusion of the head and disturbance in the dreams: and, so far as I have seen, it agrees better with the young than with those of middle life. Hildenbrand reserves it in every instance against distress from dysentery or diarrhœa.†

gangrene, bark, in addition to nourishment, wine, and other stimulants, may be given with the best effects. The sulphate of quinine, combined with sulphuric acid, is the best mode of administration."—Tweedie on Continued Fever, p. 225.

* Eph. Nat. Cur. Dec., i., ann. iii., obs. 145. With respect to wine, as a remedial agent in typhus, Dr. Wilson Philip offers two general remarks; the first is, that more or less wine is beneficial in all severe cases of typhus; and that there are few, in which large quantities are not injurious. The exhibition of wine in typhus must be as much regulated by circumstances, as bloodletting in synocha. "Wine is seldom necessary in the early stages, nor, as a general rule, at any period of the acute forms, unless, as occasionally happens, unexpected exhaustion comes on, or, towards the decline of the disease, the powers give way. Under these circumstances, a few ounces of wine, if the skin be cool, the pulse soft, and the tongue moist, will frequently improve the condition of the patient."—(Tweedie on Continued Fever, p. 216.) According to the experience of the same physician, the propriety of administering wine in fever will sometimes depend upon the type of epidemic fever. In 1829, as the records of the London Fever Hospital prove, fever required a most decided antiphlogistic treatment; in 1830 and 1831, the symptoms assuming a low typhoid form, a more stimulant plan became necessary. We have seen, that local inflammations not unfrequently arise in feeble habits, or in the advanced stage of low fever, requiring general or local bleeding. The treatment necessary to subdue the local disease, lowers the general strength; the patient does not rally, and perhaps loses ground. In such cases, Dr. Tweedie finds a moderate quantity of wine, provided the pulse be soft, and the skin cool, is followed by excellent effects. When the fever assumes the petechial character, he also approves of wine. Dr. Tweedie offers much valuable advice on this part of the subject; and, perhaps, what he has stated, joined with the remarks of Dr. Wilson Philip and Dr. Marshall Hall on the same topic, will give the best general views of the doctrines which should regulate the practice of venesection in fever.—ED.

† From the stimulant effects of opium, it is generally regarded as an improper medicine in the acute forms of fever, especially when local inflammation exists. According to Dr. Tweedie, the delirium and wakefulness of sub-acute inflammation of the brain are best overcome by topical bleeding, and the application of cold lotions to the scalp; and, when the morbid condition of the

Antimonials are a doubtful remedy: they tend to throw the action towards the surface; but, as relaxants, they tend at the same time to diminish the tone of the muscular fibre. It is not often that they can be employed with advantage. In many instances, blisters, judiciously interposed, will be found useful auxiliaries, and especially where the head is much affected; but the body should not be covered with them, as is often the case, from head to foot, so as to be highly distressing to the patient, and to exhaust the little irritability he has left. Cataplasms, or bottles of hot water applied to the feet, when the circulation is unequal, will often be a better practice.

During the entire course of the fever, from the time the bowels have been sufficiently evacuated, the patient may be allowed animal broths and jellies in alternation with the farinacea: he should be lightly covered with bedclothes; his chamber should be freed from all unnecessary furniture; his sheets and body-linen be frequently changed, and be instantly taken out of the room; as should also the egestions of every kind.

Above all things, the chamber should be freely ventilated, which is infinitely the best way of purifying the air, and dissolving the febrile miasm as it issues from the body: upon which subject we have already touched. Where the ward or chamber is large, or the sick are remote from each other, simple ventilation by opening the opposite windows, or the windows and door, will be sufficient. But where the wards are small, or may not admit of sufficient ventilation, or the patients are numerous, fumigation with nitric or muriatic acid should not be neglected. At present, we have no reason for a preference, except that the vapour of the former appears to be rather more volatile and penetrating. Of late years there have been attempts to decry the use of fumigations, and especially by M. Von Mons and Dr. Trotter, who conceive that they rather increase than diminish the septic matter of the atmosphere. On which account, they advise the room to be frequently sprinkled with water, and a good fire to be maintained,—believing that febrile contagion is much better destroyed by pure aqueous vapour than by any other means.

But this conception is founded upon a double hypothesis, and an hypothesis apparently mistaken upon both points: first, that febrile miasm and septon, or the elementary matter of putrescence, are the same thing; and next, that this common principle is nitrous oxyde, or oxyde of azote, agreeably to the conjecture of Dr. Mitchell. Of septon, however, we know but little; yet, from the established power of hydrogen in exhausting or destroying animal irritability, it is more probable that M. Morveau's conjecture of its being a combination of hydrogen with azote, rather than of oxygen with the same, is the real fact. But be this as it may, we have no more reason for believing that febrile miasm consists of either of these, than that it consists of animalcules of a peculiar kind, as was once contended for by Dr. Chandler.

Febrile miasm, we have reason to believe, is a peculiar and specific production; the chief properties of which I have already endeavoured to point out. Pure air unquestionably dissolves it; and hence there may be other gases capable of dissolving it also, and even more readily; or which, combined with pure air, may render the latter a speedier and more powerful solvent. And it is probable that the vapours of the mineral acids act in this manner. In this respect they may be useful; but, if ever employed to supersede ventilation, the opinion of Dr. Trotter, that they do more mischief than good, will be completely established. The aromas of volatile plants are of no benefit whatever; and if the fumes of tobacco were ever serviceable in the plague, it was most probably, as Dr. Cullen conjectures, from their exhilarating the spirits, like wine or opium, and diminishing the irritability.*

brain, on which the want of sleep depends, is removed, the patient generally enjoys intervals of refreshing sleep. In other cases, a state of distressing restlessness, with obstinate wakefulness, remains. If, with these symptoms, the pulse, though soft, be rapid, the skin cool, the face pale, the tongue moist, and there be no effusion of the eyes, Dr. Tweedie approves of opium. If, however, its exhibition be followed by increase of delirium, thirst, and heat of skin, or if the tongue become dry and the bowels confined, he recommends it to be discontinued. The preparations of opium preferred by this excellent physician are the muriate and acetate of morphia in half-grain doses. He has also found 15 grains, or ℈j. of camphire, joined with a quarter of a grain of the acetate of morphia, a valuable formula.—On Fever, page 227-229.

* Our author and his editor have spoken so amply of the nature and treatment of the several forms of typhus, that we have room only for a passing remark. Typhus is of rare occurrence in this country, when compared with Great Britain; and American physicians are most frequently called on to treat that type of it which Armstrong terms the congestive. Typhus is occasionally the sequel of our inflammatory and our remittent fevers; and this fact may be witnessed in the sporadic cases of typhus occurring in the pure air of the country, as well as in those instances of it which are seen in hospitals and alms-houses. The observation of Dr. Dewees, however, will have its full weight with the careful physician: "We have," says he, "in several places (Practice of Physic), borne testimony against confounding a certain condition of the system in the yellow, the continued, and the remittent fever with typhus; because they bear no analogy to it, as they all want the power of propagating themselves by contagion." As to treatment, the practice of bloodletting, though not to be enforced with the earnestness of Armstrong, will in some instances be found a remedy of great consideration. Dr. Drake remarks, (West. Med. and Phys. Journ., Jan., 1828) "that it often saves the life of the patient, although it may not *cure* the disease:" the judicious practitioner, however, must cautiously weigh the peculiar features of each case. Where the signs of increased action, fulness of the pulse, and energy of system demand it, moderate bloodletting may be of service, and may perhaps be repeated, the better to relieve the oppressed heart and ar-

[A few years ago, M. Labarraque discovered that the chloride of lime, now generally employed instead of chlorine for bleaching, likewise possesses the power belonging to that gas of destroying putrescent effluvia. It is also suspected to have considerable power in destroying the effluvia of infectious disorders. Hence, its use is ordered by the French government in all hospitals and lazarettoes. The powder should be dissolved in forty or forty-five parts of water.* Such a lotion would undoubtedly have more effect against contagious effluvia than simple water; the skin, when hot and dry, might be freely sponged with it; and the room sprinkled with it. Indeed, the preparation called the hydrochloruret of lime is recommended by Dr. Reid as an internal remedy, in certain stages of fever and dysentery.—(*Clinical Obs. on the Efficacy of the Hydrochloruret of Lime*, &c., Dub., 1827.) It has also been given by Dr. Cloquet in doses of from 20 to 30 minims, in examples of gangrene, as well as applied to the part.—(*Alcock's Essay on the Chlorurets of Oxyde of Sodium and Lime*, 1827.) The chloruret of soda has also similar powers.†]

teries. But we are to guard against a too great waste of the natural powers of the system. Local congestions will sometimes require dry cupping. As emetics remove sources of irritation from the stomach, and act on the skin, they are not to be overlooked; and mild purgatives, if prescribed with care, are among our best modes of relief. Americans differ as to mercurial remedies; while some approve of them, they are condemned by others. Drs. Tully and Miner, however (see Essays), recommend small doses of calomel, from one to two grains, every three or four hours, until its specific influence on the salivary glands is manifested. The late Dr. Warren, of Boston, bears testimony to the good effects of mercury in typhus fever.—(See his Mercurial Practice.)

We have authority for stating, that the practice by affusions of cold water has never been attended in this country with the favourable results obtained by Currie and others in England; probably from the want of a proper discrimination as to the time when this agent should be applied. To secure a salutary reaction, it is necessary that the tonic powers of the system should not have been too much impaired by disease or by medical treatment. The best form of administering opium, when necessary, is probably in the combination termed Dover's powder. We should always bear in mind the medical axiom of Younge, that where bloodletting is indicated, opium is inexpedient.—D.

* See Professor Marc's Official Report; also, Kopp's Reise in Deutschland und Frankreich, p. 198; and Edin. Med. and Surg. Journ., No. lxxxix., p. 447.

† "In the cure of fever, we must aim, in the first place, at having free ventilation, and the most perfect cleanliness; plenty of washing, plenty of clean linen, and plenty of fresh air. With fresh air and fresh water, we may go on very well; but if there be any smell which ventilation and washing will not remove, the chlorides, I need not say, are excellent things, sprinkled upon the bed, or the floor, &c. A solution of the chloride of lime ought to be put into the utensils which the patient employs, that no unpleasant smell may arise in the room—no contamination. When you first see a patient, if he be dirty, before prescribing any thing else, it is right to prescribe soap and water."—Professor Elliotson's Lectures at Lond. Univ., as published in Med. Gaz. for 1832, p. 182.

SPECIES III.
ENECIA SYNOCHUS.
SYNOCHAL FEVER.

COMPOUNDED OF CAUMA AND TYPHUS: IN ITS COMMENCEMENT RESEMBLING THE FORMER; IN ITS PROGRESS, THE LATTER.

It is not necessary, after our copious histories of the two preceding species, to follow up the present, which is a mixture of both, through a detailed description of its course. It is certainly the most common form under which continued fever makes its appearance in our own country; for it is but rarely that cases of fever occur which preserve a strictly inflammatory character from the beginning to the end. It is in fact an inflammatory fever bent out of its proper career, often, perhaps, by the temperament upon which it has to act; but still more frequently, as Dr. Brocklesby has well observed, by confined and vitiated air, and hence dropping its inflammatory pretensions in the middle of its course. Its causes are therefore the same as those that produce inflammatory fever. Dr. Cullen has entered it into his catalogue of genera after Sauvages and Linnæus; but with a doubt whether he is correct in so doing. "Since many fevers," says he, "are neither altogether inflammatory nor altogether nervous, they cannot be referred either to the synocha (cauma) or the typhus: and I have hence inserted the genus synochus, whose type is frequently seen in this country. Yet, between the typhus and synocha, I cannot place any accurate limits; and I doubt whether they should in fact be deemed genera, or have a different place allotted them." And in his First Lines he observes, "I am disposed to believe that the synochus arises from the same cause as the typhus, and is therefore only a *variety* of it." To me it appears rather to arise from the same causes as the cauma, for it commences with the cauma type. The proper rank for all of them appears to be that of species; and the present system in the text-book, in allotting them this character, steers just a middle course between Dr. Cullen's actual arrangement and his real opinion. And in this view it is distinctly regarded by Dr. Stoll, who sometimes describes it as an inflammatory fever assuming a putrid guise; sometimes as equally inflammatory and putrid; and sometimes as an inflammatory fever passing into a saburral fever.—(*Rat Med.*, vol. iii., pp. 97, 106, 113, iv., 61.) By Kausch, and other German pathologists, it is hence denominated febris inflammatorio-putrida.—(*Grüner Almanach*, 1788, p. 37.) It is, in many instances, the inflammatory typhus of Dr. Armstrong.

Occasionally it shows a considerable tendency to terminate its course abruptly by a critical sweat; it is sometimes peculiarly marked with yellowness of the skin; sometimes with great stupor of the head; and sometimes with inflammatory tension of the peritoneum. And it hence furnishes us with four varieties:—

α Sudatorius. Sweating synochus	Carried off by a critical sweat in an early stage of its progress.
β Flavus. Yellow synochus.	With yellowness of the skin, attended with a sense of burning heat.
γ Soporosus. Comatose synochus.	Accompanied with stupor from the beginning.
δ Puerperarum. Puerperal fever. Childbed fever.	Accompanied with an inflammatory tenderness of the belly: mostly occurring on the third day after childbirth.

The symptoms of the FIRST VARIETY open with great violence. There is usually an intense pain in the head, with a vehement vomiting and purging, which is rarely removed, and sometimes augmented, by an emetic: the skin is peculiarly dry and hot. The balance of the circulating system is here greatly disturbed, and there is an evident determination of blood to the head, and probably to the liver. Like the yellow fever, it rushes forward rapidly to a state of great sensorial debility; and is best checked in its progress by a free use of the lancet, which more than any thing else takes off the tendency to congestion, and the hardness from the pulse. A diaphoresis commonly breaks out soon afterward, which proves critical, and should be maintained by diluent drinks, and small doses of antimonials or other relaxants.

In the YELLOW-TINGED SYNOCHUS there is a high degree of hepatic irritation, and consequently an excessive secretion of bile, part of which is absorbed and carried into the system: whence Galen denominates it *synochus biliosus*. —(*De Differ. Febr.*, cap. ii.; *De Crisibus*, cap. ii.) It is found chiefly in the summer season, among young persons of a bilious habit, and is generally produced, like the genuine cauma, by too violent exertion under a sultry sky. It is accompanied with intolerable thirst and sleeplessness. In few words, it is a causus, or ardent fever without any apparent remission; its symptoms, with this exception, are the same, and the same mode of treatment is demanded: for which the reader may turn to the second species of the preceding genus.*

While the symptoms rage violently, there is sometimes a great determination to the head, with a sudden exhaustion of sensorial power; and hence, notwithstanding that this local affection is more severe and confirmed than in the first variety, there is a dull and obtuse, rather than an intense and pungent pain. It is the SYNOCHUS SOPOROSUS of Guarinon and Sauvages, as well as of the present system; and the continual fever of Sydenham for the year 1763. Among the chief symptoms, says he, was a coma, for the patient soon became drowsy and obscurely delirious. Occasionally, however, it was a direct lethargy, which continued for two or three weeks, during which nothing but a violent noise would rouse the patient; when, after opening his eyes, and being persuaded, perhaps, to take a little food or some medicine, he again fell into a sleep so profound, that Sauvages calls it a febrile cataphora. In some cases, however, instead of a lethargy, there was a low muttering delirium, in which the patient spoke incongruously and with fretfulness, with short snatchings of stertorous sleep interposed. The fever rarely terminated in less than fourteen days; and, when the lethargy prevailed, generally ran on to twenty-one or even thirty days. The first symptom of recovery was usually a capricious longing for some absurd kind of meat or drink. The head for many days still discovered great weakness, and even the muscles were incapable of supporting it in an erect position. Warm cordials were always mischievous: a free and repeated use of the lancet, with brisk purgatives, formed the best plan of cure, with diluting diaphoretics afterward. Sauvages asserts, that blistering the head was serviceable. Epithems of ice-water over the whole head, repeated as soon as they became warm, would probably have proved far more beneficial, as soon as the vessels of the head had been sufficiently emptied.

We find the same fever still more frequently commencing with a like tendency to the peritoneum, instead of to the head, and running rapidly into a state of inflammation, with an imperfect attempt at suppuration; and especially where this membrane has been excited by a sympathetic action with the uterus or any other adjacent organ, or by exposure to the atmosphere in consequence of a wound through the abdominal integuments. And hence this disease occurs occasionally in cases of tapping for a dropsy of the abdomen, and still more frequently after labour: on which account, it is commonly known by the name of PERITONEAL, PUERPERAL, or CHILDBED FEVER. From the days of Hippocrates to those of Boerhaave and Van Swieten, the uterus was supposed to be the chief seat of inflammation when the disease arises from this cause. But there is now no question that it originates in the peritoneum itself, and that the uterus is often very little affected; and this too, though the inflammation should spread, as it often does, to other organs in the vicinity.*

* This form of fever often prevails during the summer and fall, in different parts of the United States. It may occur in marshy soils and on the dry prairie grounds. It demands an early and vigorous treatment.—D.

* Puerperal fever is much better understood at the present time, than when Dr. Good wrote this part of his work; and instead of its being essentially a disorder proceeding from peritonitis, as was once the common belief, it is only sometimes accidentally conjoined with it. Hence the idea of the case being the same as peritonitis from tapping is completely erroneous. "From the 1st of January, 1827, to the 1st of June, 1832," says Dr. Lee, "162 cases of well-marked puerperal fever came under our immediate observation in private practice, and in the British Lying-in Hospital, and other institutions in the western districts of London. We watched the symptoms and progress of these cases with the closest attention, observed the effects of the different remedies employed.

The disease usually commences on the second or third day after delivery; though sometimes it occurs rather later, and, according to Professor Frank, sometimes a little before delivery. —(*De Curand. Hom. Morb.*, tom. ii., p. 189, 8vo., Mannh., 1792.) [Dr. Blundell has known death occur, with all the symptoms of puerperal fever, within the first four-and-twenty hours after parturition; and Dr. Haighton used to relate the case of a woman who died of a puerperal fever, which commenced ten or twelve days after delivery. According to Dr. Blundell, the later the attack, the less is generally the pertinacity of the symptoms.] It is marked by all the common symptoms of a severe febrile incursion, in combination with the tenseness and tenderness of the belly. The muscles of the back and hips are in great pain; the abdomen is tender, often acutely painful, and the pain is greatly increased by pressure, which peculiarly distinguishes this disease from enteritis; and, as the diaphragm is affected by contiguous sympathy, the breathing is also short and laborious, accompanied with most distressing anxiety. [In puerperal fever, the pulse is noted for its extraordinary frequency. Dr. Blundell says that it is scarcely ever below 115 in a minute, unless the disease be yielding to remedies; and more commonly it rises to 120, 130, or 140; and he has counted pulses of 165 or 170.] The head rarely suffers much at first; but, in the progress of the disease, is apt to become stupid and comatose. The flow of the milk and of the lochia are usually suspended, though the latter is not always so; but, in this last case, the discharge is thinner and more acrid. The stomach is sometimes, but not generally, troubled with sickness, and frequently discharges an offensive porraceous saburra; and a troublesome diarrhœa attacks the bowels.*

In the opinion of Mr. John Hunter, the disease takes place in consequence of an injury done to the peritoneum, as forming a cavity, by which its present state is either suddenly changed or rendered imperfect. The injury done to the peritoneum in the case of women after delivery, he ascribes, as his sentiments are delivered by Mr. Cruickshank, to two causes. Sometimes it proceeds from a want of disposition in the womb to recover itself after labour; by which the peritoneum, as a cavity, must necessarily be affected. At other times from a too sudden emptying of the abdomen; whence the peritoneum cannot always recover itself so as to be properly adapted to its new condition. This last cause, he observes, may also hold with men after the operation of the paracentesis. But, in them, besides the sudden emptying of the abdomen, there is the additional circumstance of a wound, which renders the peritoneum, as a cavity, imperfect. When an inflammation of the peritoneum occurs, it most frequently happens, as he still farther remarks, that it spreads over all the cavity of the abdomen. An extravasation of fluids takes place into that cavity, mixed with pus. The different viscera adhere by their peritoneal coats. The intestines are distended with air. And the irritation thus induced, kills the patient long before granulations, or an obliteration of the cavity in the second method, can occur.†

Neither of these two causes, however, by

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and, where death took place, we carefully examined the alterations of structure in the uterine and other organs. Of fifty-six cases which proved fatal, the bodies of forty-four were examined, and in all there was found some morbid change, the effect of inflammation, either in the peritoneal coat of the uterus or uterine appendages, in the muscular tissue, in the veins, or in the absorbents of the uterus, which accounted, in the most satisfactory manner, for all the constitutional disturbance which had been observed during life. The peritoneum and uterine appendages were found inflamed in thirty-two cases; in twenty-four cases there was uterine phlebitis; in ten there was inflammation and softening of the muscular tissue of the uterus; and in four, the absorbents were filled with pus. These observations are subversive of the general opinion, now prevalent in Europe and America, that there is a specific, essential, idiopathic fever, which attacks puerperal women, and which may arise independent of any local affection in the uterine organs, and even prove fatal, without leaving any perceptible change in the organization of any of their different textures. As the constitutional symptoms thus appear invariably to derive their origin from a local cause, it would be more philosophical, and more consistent with the correct principles of physiological arrangement, to banish entirely from medical nomenclature the terms *puerperal* and *childbed fever*, and to substitute in their place *that of uterine inflammation*, or inflammation of the uterus and its appendages in puerperal women. The terms *puerperal peritonitis* and *peritoneal fever*, employed by some English and foreign physicians, are not less objectionable than puerperal fever; for, in many of the fatal cases, there is no proof whatever of the existence of any affection of the peritoneum."—Dr. R. Lee in Cyclop. of Pract. Med., art PUERPERAL FEVER.—ED.

* "If we consult the works of the most celebrated writers in this country on puerperal fever, it will clearly appear," says Dr. Robert Lee, "that they all describe the disease as commencing with a sense of soreness, or exquisite tenderness, in the region of the uterus; and that where it proves fatal, the appearances on dissection are such, as afford unequivocal proofs of inflammation of one or more of the pelvic and abdominal viscera. Strother, Burton, Millar, and Wallace Johnson state, that the distinguishing marks of the disease are pain of the hypogastric region, abdomen, and loins, and that relief often follows venesection."—(Cyclop. of Pract. Med., loc. cit.) These unintended confirmations of the modern doctrine (which Dr. Good represents as having been also that of Hippocrates and Boerhaave) are highly deserving of attention.—ED.

† Edin. Med. Comment., vol. iii., p. 322. Now that the pathology of puerperal fever is better understood, these reasonings about the cause of peritonitis, the imaginary essence of the disease, are not of great importance. That the peritoneum is frequently inflamed, is undoubtedly true; but that it is always so, is not the fact. In 222 cases, examined after death by M. Tonellé, the uterus was affected in 197, and the peritoneum in 193. There was pus in the uterine veins and lymphatics in 134 cases. Des Fièvres Puerpérales observées à la Maternité de Paris, pendant l'Année 1829; Arch. Gén. de Méd., Mars et Avril, 1830.—ED.

themselves, will often, if ever, produce the fever before us, or even peritoneal inflammation alone. For the uterus is perpetually exhibiting a morbid enlargement, without a disposition to recover itself: and the abdomen, sudden evacuation, while no such fever ensues. There must co-operate a peculiar temperament, or a peculiar condition of body at the time; and, in puerperal patients, there is especially the general pyrectic excitement which necessarily follows the very great change in various organs after delivery, and the transfer of accumulated action from one organ to another. Another accessory is also frequently found in the constitution of the atmosphere; for whatever change is most calculated to produce fever from a morbid excitement of the abdominal viscera, cannot fail to co-operate in the production of this disease from a local cause. I have already observed that such a change most usually occurs in autumn, and have stated the grounds on which it depends, under the history of *epanetus autumnalis*, to which the reader may turn at his leisure.—(See Cl. III., Ord. I., Gen. III., Spec. 2.) And hence, so far as I have observed, a tendency to peritoneal or puerperal fever occurs more frequently at this season than at any other; and, on this account, it is said by Dr. Douglas of Dublin, M. Vandenzande,* Dr. Blundell, and some other writers,† to happen occasionally as an epidemy.—(*Clark, Edin. Med. Comment.*, vol. iii.) There is much reason, indeed, for regarding it in this last view; for as most of the auxiliaries that unite in the production of contagious miasm are present in a lying-in chamber, such miasm is frequently the result; often, indeed, as we have reason to believe, generated after the manner of typhous miasm, and completely elaborated in the circulating and secreted fluids of the patient herself. Of this fact, indeed, we seem to have a striking illustration in the official report of the malignant puerperal fever that raged so fatally in the lying-in department of the General Hospital at Vienna in 1819 (*Edin. Med. and Surg. Journal*, No. lxxx., p. 83); but there can be no longer any question, after the accounts of the disease published by Dr. Gordon of Aberdeen, and Dr. Young of Edinburgh, as it appeared in the lying-in infirmaries of these cities; in which woman after woman continued to be infected to a very great extent, and especially where they had close communication with puerperal patients, or had even been attended by nurses or midwives who had previously attended the latter without sufficiently changing their malignant dress. This disease was only subdued by the ordinary means employed to exterminate contagious miasm, such as great cleanliness, repeated change of sheets and body-linen, free ventilation, and a total separation of those who were labouring under the disease from those who were about to be confined.*

In all kinds of contagious fevers, we find that some persons are more liable to be infected than others from incidental circumstances; and, as I have already had occasion to observe, in laying down the laws of febrile miasm so far as we are at present acquainted with them, the miasmic corpuscles are modified in a few of their properties by the accessories to which they are exposed, or by which they are produced. And, by bearing these facts in mind, we shall have no difficulty in accounting for the limitation of this contagious fever to puerperal women, and the exemption possessed by persons who are not under the same circumstances. For, operative as the miasm unquestionably is, where the predisposition exists, and the abdominal organs are thrown out of the balance of healthy action, it is inert where no such predisposition is to be found, and these organs are in elastic vigour. Dr. Douglas extends this view of the case further than many pathologists; for he conceives that women, whether pregnant or nursing, or for several months after confinement, though not nursing, are susceptible of the disease upon the application of contagion.†

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* Obs. pratiques sur la Maladie connue sur le nom de Péritonite, et de Fièvre puerperal, Anvers, 8vo., 1821; J. P. Frank, De Cur. Hom. Morb., tom. ii., p. 197.

† Treatise on the Puerperal Fever, illustrated by Cases which occurred in Leeds and its vicinity in the years 1809–1812, by William Hay, Jun., &c.

* Compare Dr. Campbell's Treatise on the Epidemic Puerperal Fever, as it prevailed at Edinburgh in 1821–2, Edin., 8vo., 1822.

† Report on Puerperal Fever; Dublin Reports, vol. iii., p. 145. Dr. Robert Lee does not attach much importance to this view of the subject; and, according to the observations which he made on the epidemic typhus of Edinburgh in 1816 and 1817, and during the last five years in this metropolis, lying-in women are rarely affected with common typhus. "It is to the uterus, which is left in a condition after delivery in which no other organ of the body is ever similarly placed, and which renders it peculiarly liable to attacks of inflammation, that we are to look for an explanation of all the phenomena of puerperal fever."—(Cyclop. of Pract. Med.) Supposing this doctrine to be correct, we must presume that the statements of puerperal fever being contagious, and capable of exciting a similar disorder in other women, cannot be free from doubt. Dr. Hulme maintains that it is not more contagious than pleuritis, nephritis, or any other inflammatory disease. "M. Tonellé, who has recorded the history of the most fatal epidemic which has ever occurred in Paris, asserts that the idea of contagion was clearly out of the question there; for, in the Maternité, the women who were newly delivered had each a separate apartment, and yet were attacked with the disease; while, in the sick ward of the hospital, no instance of the propagation of puerperal fever ever occurred. The evidence of M. Dugès against the doctrine of contagion is equally strong; for he states that in numerous instances, pregnant women have been placed in the infirmary, where they were surrounded by cases of peritonitis, without imbibing the germe of the disease; and that still more frequently he has seen women, newly delivered, brought with some other complaint into the infirmaries, who did not contract the reigning malady, notwithstanding the miasmata which surrounded them. In no instance has he observed a midwife, charged with the care of two women at the same time, communicate peritonitis from a sick to a healthy individual, as

But whether the miasm thus generated be the common febrile miasm we have contemplated in several of the preceding species, merely modified in its powers by accidental circumstances, or a contagion specific and peculiar to itself, is a question which, at present, we have not the means of determining.

I have said, that in the inflammation which takes place, there is an imperfect attempt at suppuration. The fluid secreted or effused is usually a whey-like material, or milky ichor, or as Mr. Cruickshank has described it, an extravasated matter mixed with pus. But Dr. Hulme (*Treatise on the Puerperal Fever*) asserts, that he has sometimes found genuine pus apparently secreted without ulceration; and Dr. Meckel informs Baron Haller, that he has witnessed the same very extensively.—(*Epist. ad Haller. Script.*, vol. iii.) The nature of the fluid will, indeed, entirely depend upon the vehemence and rapidity of the inflammatory process. Where this is less violent, the secretion, as from the surface of other serous membranes, may be purulent, or even genuine pus, and has sometimes amounted to several pints; but where more violent, it will be a milky, caseous, or whey-like serum. It is rarely, however, so mild and temperate in its march as to produce pus; often running on, as Dr. Hulme has observed, to a state of gangrene at once; and, in some instances, has been found to involve the intestines, omentum, and all the neighbouring viscera in the common mischief, as has been abundantly established by post-obituary examinations.—(*De la Roche, Recherches*, &c.) And hence, the uterus itself has sometimes participated in the inflammation, and has shown pus or gangrene, according to the vehemence and rapidity of the morbid influence.* The secreted fluid, from its abundance, is called by Professor Frank, "acutus purulentusque hydrops;" who further tells us, that he has sometimes traced it in the lungs, pleura, cavity of the chest, and even in the pericardium, where these organs have associated in the inflammation.*

The general treatment of this disease should closely resemble that already laid down for the severer varieties of the malignant remittent, which it very much resembles, with the exception that the fever is continued instead of being remissive; and that the local irritation is seated in the peritoneum (or, as Dr. Good should have said, in the uterus and its appendages), instead of in the liver or any other organ. This inflammation must be subdued, and that speedily, or the patient will perish; and hence abstraction of blood and calomel purgatives are the arms on which we have chiefly, if not solely, to depend; and both should be employed decidedly, and to as great an extent as we dare.

Eighteen or twenty ounces of blood should be drawn from the arm as soon as possible after the commencement of the disease, and repeated within twelve hours, if necessary, and the strength will allow; but if venesection have not taken place before the third day, the debility will have gained so high an ascendency, and the general symptoms put on so putrescent a complexion, that little benefit is to be gained from it. The bowels should, at the same time, be moved by six or eight grains of calomel, given

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is reported to have happened in London; and never has this inflammation been propagated from patient to patient in the wards set apart for the reception of healthy women.—(Baudelocque sur la Péritonite Puerpérale, 8vo., Paris, 1830.) "In the earlier description, however, of uterine inflammation, it is referred, not only to the corrupted atmosphere of hospitals, but also to contagion. In the Dublin Lying-in Hospital, the Edinburgh Infirmary, the General Lying-in Hospital at Vienna, and in most of those in this metropolis, it has raged as an epidemic, at different periods, with great violence, and appeared to be propagated by contagion."—(Dr. R. Lee, in Cyclop. of Pract. Med., loc. cit.) This able physician inclines to the doctrine of contagion; but candidly admits, that his facts have not, perhaps, been sufficiently numerous to dispel every doubt on the subject. His valuable writings on this disease particularly claim the notice of the profession. The researches of Dr. Lee confirm the fact, that inflammation of the uterine organs, like inflammation of the lungs, and other affections assuming an epidemic form, takes place more frequently in one season than another, and that, at one period, the peritoneal covering of the organ is the tissue most commonly affected, while, in other seasons, the deeper tissues are almost invariably found inflamed.—ED.

* Bang, Act. Soc. Hafn., i. One great mistake in Dr. Good's account is that of supposing the peritonitis to be the essential affection, and the inflammation of the uterus and its appendages to be merely an occasional circumstance. The same mistake prevails in the works of Bichat, Pinel, Dr. J. Clarke, the late Dr. Gooch, and other men of eminence. Dr. Gooch, in his dissections, seems to have been satisfied with simply inspecting the peritoneal covering of the uterus; but Dr. Robert Lee is inclined to believe, that "if he had carefully examined the spermatic and hypogastric veins, the absorbents, the uterus and its appendages, with the sub-peritoneal tissues, he would frequently have found acute inflammation, or some of its products. The following is the general inference drawn by Dr. Lee respecting the nature of puerperal fever:—"That inflammation of the uterus and its appendages must be considered as essentially the cause of all the destructive febrile affections which follow parturition, and that the various forms they assume, inflammatory, congestive, and typhoid, will, in a great measure, be found to depend on whether the serous, the muscular, or the venous tissue of the organ has become affected."—(Med.-Chir. Trans., vol. xv., part ii., p. 405, 1829.) A large proportion of typhoid puerperal fevers arise from uterine phlebitis and its consequences. In the report of the epidemic puerperal fever which occurred in the General Hospital at Vienna, in 1819, we are informed that the accession of fever was always preceded by marked changes in the whole system, particularly in the uterus, clearly indicating an inflammatory state.—Med. Annals of the Austrian States, 1822; and Dr. Robert Lee's Paper in Cyclop. of Pract. Med.—ED.

* De Cur. Hom. Morb. Epit., tom. ii., p. 196, 8vo., Mannh., 1792. Whoever has studied the nature and effects of phlebitis, will here discover at once evidence of the existence of inflammation of the veins of the uterus and its appendages. Phlebitis, in its extensive and fatal forms, commonly occasions inflammations and depositions of pus in various organs and tissues.—ED.

in the form of a pill; and the same preparation, to the amount of three or four grains—Dr. Douglas advances the dose to not less than ten grains—should be continued every six hours till the tension and soreness of the abdomen have abated. And it will often be useful to accompany the calomel with one or more doses of castor-oil, or the essential oil of turpentine, or both combined.*

Dr. Vandenzande (Op. cit.) depends upon a free exhibition of calomel without venesection, which, after the manner of Dr. Hamilton, of Ipswich, he unites with opium; and he boasts of the certainty of success which this treatment has developed; though, in conjunction with opium and calomel, he sometimes employs mercurial friction. There can be no question of the benefit of a liberal use of calomel in an early stage of the disease; but to let it supersede the use of the lancet, is to abandon our first chance of success, and to encounter an unnecessary peril.

It happens not unfrequently, however, that the patient's frame is so weak and delicate, that we should risk more by drawing blood generally, than even by leaving the case to nature; as it does also that the stomach and bowels are, from the first, in a very high degree of irritation, with violent purging and vomiting, and will not bear any additional stimulant. Our wisdom is here to yield to circumstances, and let the general rule admit of particular exceptions. Instead of the lancet, we should have recourse to leeches, and, in this manner, remove twelve ounces of blood at the least; and unite opium with smaller doses of calomel. It does not follow that calomel in such a combination will increase the irritation of the stomach or bowels; I have often seen the contrary; and that by the exhibition of two or three grains with one grain of opium, repeated every five or six hours, the irritation has yielded to the commencement of a new action.

It is also in such cases of extreme debility that the essential oil of turpentine has often been found highly beneficial when employed internally by itself; for while it operates as a mild aperient, it acts as a counter-irritant, and hence directly influences the morbid state of the peritoneum, while the pulse is supported by its stimulant power, and a pleasant moisture is sometimes diffused over the surface. It is, in truth, with the exception of camphire, the only cordial we can safely venture to employ. For the purpose before us, the dose should be about two drachms; which may be repeated every two or three hours.†

Warm and anodyne fomentations to the abdomen are usually prescribed at the same time, and are often found palliative, particularly the essential oil of turpentine, which may be used externally as well as internally; but the common mode of applying them makes the bed wet, and gives great fatigue to the patient. And hence, I have ordinarily prescribed a large piece of folded flannel, wrung out forcibly in as hot water as can be borne, to be applied over the whole of the pubes and abdomen, and covered by a broad flannel or linen swathe, passed under the loins, and folded over the epithem of reeking flannel, which is to remain for many hours, or till it becomes dry, as all that is wanted in this application, as in a common bread-and-water poultice, is warmth and moisture; the flannel answers the purpose as well as the bread; and while I do not recollect a single instance in which this application has not been soothing and serviceable, I have never met with a case in which a chill has been complained of.

In the meantime, a diapnoë, or breathing perspiration on the surface, should be attempted by small doses of ipecacuanha, or Dover's powder, and with the addition of a solution of acetate of ammonia; and if the debility be very considerable, we may employ free doses of camphire, beginning with half a scruple, and proceeding to half a drachm at a time, every four or five hours, with great advantage.

If this plan should not answer, and the skin be still hotter, drier, and more pungent to the touch, the pulse quicker and more wiry, and the tongue more deeply furred, it may be advisable to exchange epithems of hot for those of cold, or even ice-water, as already recommended in cases where the head is chiefly affected, instead of the peritoneum (uterus and its appendages).* I freely confess that I have

* Dr. Channing, Prof. of Obstetrics in Harvard University, Cambridge, has remarked, that during puerperal epidemics, those women have been most frequently observed to do well who have suffered least from costiveness during pregnancy, and more especially if the bowels have been freely opened during labour.—D.

† See Edin. Med. and Surg Journ., 1822, p. 538. Communication from Dr. Hy. Paine.

* Puerperal fever may or may not be conjoined with peritonitis, though the latter condition is the more frequent form; and it is unquestionably more consonant with the principles of modern pathology to consider the disease as essentially an inflammation of the uterus, extending at times to the appendages of that organ: the greater susceptibility of the lying-in woman to inflammatory action from accidental exciting causes, must account for the more frequent occurrence of this complaint at particular periods. It seems sometimes to be aggravated by certain specific causes, and thereby to have its type modified. Hence many clinical writers have divided hysteritis into two kinds, the inflammatory, and the typhoid, or contagious. It may occur at any time sporadically, and, in particular seasons, it sometimes prevails almost with the violence and destructiveness of an epidemic. Dr. Dewees, of Philadelphia, however, remarks:—"So far as we know, this disease has never appeared as an epidemic in this city, though sporadic cases have been more frequent at one time than at another."—Dis. of Females, Phil. edit., 1833, p. 375. Other cities have not been similarly favoured.

This disorder occurs more frequently in Great Britain than on the continent, and is comparatively rare in its more malignant form in the United States; this fact seems explainable, when we consider the better condition in this country of that class among whom it is most frequent abroad.

The English editor has given a valuable and sat-

not tried this plan myself hitherto, but it is strongly recommended by Loeffler and other physicians of great repute; and as it is a practice in common use in our own country in the case of flooding, without any evil resulting from it, we have no reason to expect any harm from it in the case before us; for the sensibility is here still more obtunded than in flooding, and nearly as much as in deliquium.*

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isfactory statement of the morbid changes caused by this affection, as seen in dissection: and Dr. Gooch also has recorded the post mortem appearances, which correspond with those usually observed as arising from general peritoneal inflammation.—(Diseases of Women.) "The disorder, however," says Dr. Francis, "sometimes extends its ravages even farther than is noticed by Dr. Gooch; and other serous membranes become affected; the pericardium is occasionally coated with lymph, and serum is found in its cavity; and the pleura is also in a like condition; a fact long since recorded by Clarke. In some instances, great cerebral congestion occurs. These extensive evidences of morbid derangement were noted in the examinations of several cases of puerperal fever, made by Professor Bushe, in Dublin, 1825, and at Chatham, in 1826-7. Many of the like morbid phenomena, occasioned by this disease, were observed as it prevailed in the Penitentiary at New-York, in 1828: and I have in my collection of morbid parts, the uterus of a subject who died during this last-named prevalence of the complaint on the third day after delivery; the parietes of which are nearly three quarters of an inch throughout, and at the fundus one and a quarter inches in thickness."—(Denman's Midwifery, edited by Prof. J. W. Francis, 3d edit., New-York, 1829, p. 676.) We have seen other specimens, exhibiting most of the phenomena so accurately recorded by Dr. Lee, in the extensive and very valuable cabinet of morbid anatomy possessed by Dr. Francis.

In regard to treatment, we can add but little to what is already stated: we would refer, however, to Dr. Francis' valuable edition of Denman already quoted; to Dr. Dewees' chapter on Puerperal Fever, in his Diseases of Females; and to Dr. G. S. Bedford's highly useful translation of Baudelocque's Prize Essay on Puerperal Peritonitis, New-York, 1833.—D.

* The practice recommended by Dr. Good is not materially different from what has the sanction of those writers who have given a better theory of puerperal fever. Where *inflammation of the peritoneal coat of the uterus* is fully developed, and where the affection occurs in a severe sporadic or epidemic form, Dr. Lee is an advocate for general and local bleeding, mercury, opium, cathartics, diaphoretics, and blisters. He begins with taking away from twenty to twenty-four ounces of blood, and, if necessary, lets the use of the lancet be followed by the application of two or three dozens of leeches to the hypogastrium, afterward promoting the bleeding from the bites by means of fomentations, or a thin linseed poultice. At the same time, he prescribes ten grains of calomel, with five of antimonial powder, and gr. iss. or gr. ij. of opium, or with gr. x. of the pulv. ipecac. comp.; and these medicines are to be repeated every three or four hours, until the symptoms begin to subside. After the second dose of calomel, he has often seen great benefit result from giving the infusion of senna with salts, and repeating it according to circumstances. Dr. Lee finds that there are few cases in which it is requisite to repeat the bleeding from the arm; and where such practice does become necessary, not more than ʒxii. or ʒxiv. of blood should be drawn. After the violence of the attack has been subdued, the calomel is to be continued every six hours, until the mouth is affected, or the uterine tenderness has been removed, but only in doses of gr. v. combined with the same quantity of the pulv. ipec. comp. When the attack is less formidable, the depletion, mercury, and opium, need not be carried to the extent above recommended. With respect to the oil of turpentine, Dr. Lee seems to place no confidence in its usefulness, the statements about its effects, delivered by Dr. Brenan, who first employed it in the treatment of puerperal fever, and by Drs. Douglas, Joseph Clarke, and Armstrong, being altogether contradictory. The same view is taken of colchicum and digitalis. As for emetics, advised by Doulcet, Dr. Lee has met with no case in which he considered it safe to administer them in any stage of the complaint. The application of blisters or oil of turpentine to the hypogastrium, after general and local bleeding, has often been found advantageous. The warm-bath, and even warm injections into the uterus, are favourably spoken of by some foreign practitioners. When the stomach is severely disturbed, and not relieved by anodynes and saline effervescing draughts, Dr. Lee recommends ʒj. of subcarbonate of potash to be dissolved in ʒv. of aqua menth. vir., and ʒj. of the mixture to be given every two or three hours. When the inflammatory symptoms have been subdued, and the patient is left in a state of great exhaustion, quinine, ammonia, and wine are to be administered. With regard to the treatment of *inflammation of the uterine appendages*, and *of the deep-seated tissues of the uterus itself*, whether of the absorbents, veins, or *muscular structure*, Dr. Lee finds the symptoms from the commencement to contra-indicate general bloodletting. He approves of leeches and fomentations, where the pain is severe. The French practitioners confide in mercury, so employed as to excite salivation: but Dr. Lee appears to have no reliance on this, or any other means yet suggested for the relief of inflammation of the deep-seated tissues, the veins, absorbents, &c. of the uterus.—(See Cyclop. of Pract. Med.) As. M. Tonellé has noticed, the presence of pus in the vessels, and its necessary transmission through the circulation, causes a rapid and palpable infection of the blood, and various phenomena which communicate a specific character to the fever. It is then the fever of phlebitis, which is known to be often complicated with inflammation and depositions of pus in different textures, viscera, and regions of the body. The reader will see some valuable observations on puerperal fever in Dr. Ryan's Manual of Midwifery, p. 635, ed. 2, where he refers also to some of the best works on the subject.—ED.

ORDER II.
PHLOGOTICA.
INFLAMMATIONS.

FIXED HEAT AND PAIN OR SORENESS; INCREASED SECRETION; LESION OF A PARTICULAR PART OR ORGAN; MOSTLY ACCOMPANIED WITH FEVER.

THE diseases comprised under this order are sometimes called Local Inflammations; as the term General Inflammation is, by a few writers, and particularly by Dr. Fordyce, applied to Cauma, or Inflammatory Fever. In the present text, the ordinal name made choice of is PHLOGOTICA, from φλέγω, "incendo," "ango." Linnéus employs *phlogistica*, from the same root; but as the chymists have long since laid hold of phlogiston, and the term, though lately disused, has a chance of being restored, the derivative PHLOGOTICA seems preferable. Dr. Cullen has PHLEGMASIÆ, after Galen and Sauvages; but as *phlegmasia* and *phlegmatic*, from the same source, import, in common medical language, a very different and almost an opposite idea, the author has also purposely passed by this term in order to prevent confusion. The nature of the fever accompanying the inflammation, cannot enter into the definition; for this will vary with the nature of the inflammation itself, and not unfrequently with the structure of the organ.

When an inflammation takes place near the surface of the body, there is not only heat and pain, or soreness, but more or less swelling, hardness, and redness, and we hence infer the existence of these last symptoms in inflamed parts which lie beyond the reach of vision.

In most cases, inflammation begins at a point; for, at the commencement, all the local symptoms lie within a very small compass. The spreading of the inflammation is owing to continued sympathy, the surrounding parts participating with the point of irritation; and, in proportion to the health of the surrounding parts and constitution, this sympathy is less.

The act of inflammation seems to consist in an increased action of the vessels; mostly, if not altogether, of the extreme vessels; for wherever inflammation appears, it may be confined to a point, in which none but the smallest vessels can exist. Independently of which, we have already had occasion to observe, that the capillaries are endowed with the property of contractility, and consequently are more capable of sustaining the phenomena of inflammation than the arterial trunks.

The first act of the vessels, when the stimulus which excites inflammation is applied, Mr. Hunter supposes to be precisely similar to a blush; and to consist in a simple distention or increased diameter beyond their natural size; such as we see takes place on the application of a gentle friction, or of gently stimulating medicines, to the skin; and the consequence of which is a warm glow, when limited to the degree we are now supposing; but which, if carried farther, would be followed by excoriation, suppuration, and ulceration.*

The inflamed vessels, being thus enlarged and irritated, begin to separate from the blood they contain some portion of its coagulating lymph, together with some serum, red globules, or whatever other fluid the vessels may be loaded with; and to throw these materials out on the internal surface of the part inflamed; probably through the exhalants, or, perhaps, through new vessels which may be now forming around them; whence the sides of the cellular membrane, which receive the effusion, become covered with it, unite with the opposite sides with which they are in contact, and thus form the first foundation of adhesion. "It appears," says Dr. Lucas, "that whenever the vessels act with unusual force, there is a tendency in the coagulating lymph to separate from the other constituent principles of the blood; by the effusion of which, as the most sanguineous part of the blood, it is probable, that the circu-

* Three elementary parts of the body are primarily and essentially affected in inflammation, viz., the bloodvessels, the nerves, and the blood. In the various views taken of the nature of inflammation, the share which the nerves have in the process has generally been too much overlooked.* Will the arteries begin the increased action, whatever this may be defined, unless influenced to do so by the nerves? In the summary of the changes which occur in inflammation, as this process is described by Kaltenbrunner (Récherches Experim. sur l'Inflammation), we find, therefore, increased sensibility of the part specified very correctly as *followed* by increased action of the vessels, quickened circulation, increased influx of blood, dilatation of the small vessels and capillaries, admission of red blood into vessels previously colourless, turgescence, swelling, and sometimes a slow and embarrassed circulation. This is the first stage, or that of *active congestion*. If the disorder advance further, the contractility of the vessels is paralyzed by their over-distention, the blood stagnates and undergoes changes in its composition, disease of the coats of the bloodvessels, rupture of many vessels, extravasation and effusion of blood, coagulable lymph, and serous fluid, and changes in the structure of the part affected, take place, constituting complete inflammation. As Drs. A. Crawford and Tweedie, the authors of the article INFLAMMATION, in the Cyclop. of Pract. Med., have observed,—"This view of the theory of inflammation has the advantage of accounting, in the most satisfactory manner, for many of the modifications of common inflammation. The exciting cause may be of such a nature as at first to stimulate both the sensibility and vascular contractility of the part, and induce a degree of congestion. But if its action be increased beyond a certain point, it may have an opposite effect in lessening both the sensibility and vascular contractility, and inducing a state of torpor; the blood will then stagnate, not from excessive irritation and distention of the vessels, but in consequence of their deficient vitality and relaxed condition."—ED.

* This remark is extremely just. In a post-mortem examination made at the Hospital la Charité at Paris, by Roux, it was remarked, that the nerves of the arm and forearm were inflamed, and several of them, particularly the median nerve, contained small abscesses of pus.—See Mémoires de l'Académie Royale de Médecine, tome troisiéme, 3e fascicule, p. 50, Paris, 1834.—D.

lation of the remaining part is facilitated, independent of the relief obtained by the diminution of volume."—(*On the Principles of Inflammation and Fever*, 8vo., 1822.) We may at least hereby readily account for much of that diminution of pain which often takes place while the swelling still continues, or is even augmented. The increased bulk of an inflamed part is produced chiefly by the effusion; and the increased redness, partly by the larger quantity of blood contained in the distended old vessels, and partly by the production of new vessels formed out of the coagulating lymph thus extravasated.*

Inflammation, therefore, consists in an increased impetus and accumulation of blood in the vessels affected, accompanied with a proportionate swelling and sense of heat. The pathologists have pretty generally concurred in ascribing this accumulation of blood to an obstruction of some kind or other; but they have differed upon its nature and origin; and have not been able to determine whether it be dependant upon the crasis of the blood itself, or the resistance of the vessels that contain it.

Generally speaking, however, it has, by all the schools of medicine, been ascribed to whatever has been supposed to be the proximate cause of fever: and hence the humoral pathologists attributed it to a lentor or viscidity of the circulating fluid; and the corpuscular, to an error loci, concerning both of which we have already treated; the cause of obstruction, in the view of either hypothesis, being seated in the nature or misdirection of the constituent parts of the blood itself: while Dr. Cullen refers it to the same kind of spasm, which he regards as the proximate cause of fever; and hence derives the obstruction from a constrictive resistance in the vessels of the part affected: which, he farther supposes, forms but a mere link in the tensive chain of a phlogistic diathesis, which more or less runs through the entire habit at the time of inflammation, and constitutes the predisposition to its rise and progress.

"That a spasm," says he (*Pract. of Phys.*, vol. iv., sect. ccxlvii.), "of the extreme vessels takes place in inflammation, is presumed from what is at the same time the state of the whole arterial system. In all considerable inflammations, though arising in one part only, an affection is communicated to the whole system; in consequence of which an inflammation is readily produced in other parts besides that first affected. This general affection is well known to physicians under the name of *diathesis phlogistica*. It most commonly appears in persons of the most rigid fibres; it is often manifestly induced by the tonic or astringent power of cold; increased by all tonic and stimulant powers applied to the body; always attended by hardness of the pulse; and most effectually taken off by the relaxing power of bloodletting. From these circumstances it is probable, that the diathesis phlogistica consists in an increased tone or contractibility, and, perhaps, contraction, of the muscular fibres of the whole arterial system."

To the first two of these hypotheses the same objections apply, that we have already seen apply to them as causes of fever. That an error loci occasionally takes place, or, in other words, an entrance of red or other particles of blood into minute vessels to which they do not naturally belong, is unquestionable; but then this is rather a secondary than a primary link in the chain of inflammation, and consequently an effect rather than a cause.

Yet the hypothesis of Dr. Cullen does not seem to be more satisfactory, and is especially open to the two following objections, to say nothing of various minor difficulties with which it is attended.

It supposes, in the first place, as a general rule, that inflammations of every kind, however minute and circumscribed, are dependant upon a particular habit of body at the time, distinguished by the name of a phlogistic diathesis. But we see inflammations occurring in habits of every kind, and varying in many of their features according to the variety of the habit; and we see them also arise in individuals who have no such phlogistic habit or diathesis as is here referred to. And we often, moreover, see examples of this very diathesis operating upon individuals for years, without producing any such effect as inflammation in particular parts. And we cannot, therefore, regard such a diathesis as a proximate cause of inflammation in general, though it may often be so of a particular kind of inflammation. Dr. Cullen, indeed, was aware of this difficulty, and even admits it. "Such a state of the system," says he, "seems often to arise and subsist for some time without the apparent inflammation of any particular part: but such a state of the system renders it *likely* that a spasm *may*, at the same time, readily arise in any of the extreme vessels, and a particular inflammation be there produced. It does, however, appear also, that the general diathesis frequently arises from inflammation begun in a particular part."

Now, this is not only to admit the difficulty, but to fall prostrate before it. It is to admit what at once settles the entire question. The cause and the effect are made to change places: and the phlogistic diathesis is as broadly stated to originate from inflammation in a particular part, as inflammation in a particular part is stated to originate in the phlogistic diathesis.

But, secondly, this hypothesis seems not only to be chargeable with incongruity, but to be directly at variance with the ordinary train of phenomena by which inflammation is accompanied. That the habit here alluded to, under the name of diathesis phlogistica, exists, and that very frequently, is not to be questioned; and Dr. Cullen has very lucidly described what is ordinarily meant by it. "It seems probable," says he, "that the diathesis phlogistica consists in an increased tone or contractibility, and

* The generality of pathologists at the present day do not adopt the opinion that the new vessels are formed out of the coagulable lymph, but that they extend or shoot into such lymph from the neighbouring original vessels.—Ed.

perhaps, in an increased contraction, of the muscular fibres of the whole arterial system;" "it appears most commonly in persons of the most rigid fibres." But I believe it will be found by every one who investigates the subject, that so far from this being the habit of body in which inflammation is most frequently to be met with, it is that in which it occurs more rarely than in many others. That it occurs in it at times is unquestionable; for inflammation, under some form or other, occurs in habits of every kind: but if we look for specimens of larger or smaller inflammation, of deep-seated or superficial, nay, even of suppurative or ulcerative, we shall meet with them, if I mistake not, far more generally in constitutions marked by mobile and irritable than by firm and rigid fibres; in habits characterized by atonic, rather than by entonic action. It is not till the constitution has been broken down, and the liver rendered feeble and torpid by the influence of a tropical sun, that hepatitis makes its appearance in its ordinary course of attack; phthisis occurs in relaxed and delicate, and not in hardy and robust frames; psoas abscess, peritoneal inflammation, struma, and those vast formations of pus which are sometimes found in parabysmic tumours or physconies, for the most part follow the same track; while the best, if not the only remedy for the innumerable host of erythematic inflammations, whether erysipelatous, gangrenous, or vesicular, pernio or intertrigo, is to raise the part or the constitution to that scale of vigour, the reduction of which is well known to form a common predisposition to all of them.* That there may exist such a condition of body as an inflammatory diathesis, or a predisposition to inflammatory action of some kind or other, according to the idiosyncrasy or established habit, or some controlling accident, is unquestionable; but such a diathesis cannot be made synonymous with the phlogistic diathesis as described by Dr. Cullen, unless there be but one kind of inflammation, and that such an inflammation as has a natural and necessary relation to the entony and rigidity of fibre which are here presupposed.

The little that we know upon the subject may, perhaps, be comprised in a few words: the standard of firm health is the best guard against inflammations of every kind, or the state in which a man is least susceptible of them; and a deviation in either direction, whether towards a habit of entony or atony, capacifies him for breeding them. But it does not capacify him equally; for, in the latter case, they are produced far more easily and generally than in the former.

And, as in weak parts or habits, a peculiar susceptibility of irritation seems to be a necessary adjunct in the production of inflammation, it is possible that it may be equally necessary in the opposite state of excessive firmness and rigidity of fibre; since this also will, at times, continue for years without giving rise to any inflammation whatever, and seems equally to demand an exciting accessary. And hence the real inflammatory or phlogistic diathesis, constituting, however, a remote, more properly than a proximate cause, is, perhaps, to be found in increased irritability of the living fibre, rather than in an increased rigidity and vigour.

The great difficulty in the subject is that of reconciling the increased action which seems to take place in the vessels of an inflamed part, with the general intumescence of such part, and, as is commonly conceived, the augmented diameter of the inflamed vessels themselves; since the ordinary effect of increased arterial action seems to be that of an increased contraction, and consequently a diminished diameter of the affected vessels, which would lead to an extenuation, rather than an enlargement of the inflamed part. And hence a directly opposite view of the subject has been taken by many pathologists of deserved authority in our own day, who have regarded the proximate cause of inflammation as consisting in a *decreased*, instead of an *increased* arterial action, and consequently as evincing a lower, instead of a higher degree of contractility. Upon this hypothesis, the inflamed arteries give way too readily to the impetus of the blood from the heart, and the part affected becomes swollen from the excess of blood that flows into it, and acquires additional heat and redness from the same cause.

There is something highly plausible in this explanation: and those who wish to trace it further may find a very neat and interesting statement of it in Dr. Bostock's valuable Elementary System of Physiology.—(Vol. i., p. 420, 8vo., 1824; also, in *Thomson's Lect. on Inflammation.*) It was first advanced by Vacca, an Italian physiologist, about the middle of the last century, and has since been supported by Mr. Allen in his lectures at Edinburgh, by Dr. Parr, Dr. Wilson Philip, Dr. Thomson, and Dr. Hastings.*

* The doctrine that erysipelas is necessarily connected with debility, and that its treatment essentially requires tonic remedies and stimulants, is one that was generally prevalent about fifty years ago, and still continues to influence the precepts of particular schools. From the foregoing passage, it appears that Dr. Good entertained a similar belief; but though erysipelas sometimes occurs in debilitated subjects, and sometimes, by the severity of its course, reduces the patient to a state requiring tonics and stimulants, just as other inflammations do, experience proves that its existence is not inseparably connected with weakness; that, on the contrary, it frequently takes place in strong, young, plethoric constitutions; and that it is often most benefited by bleeding and other antiphlogistic measures. On this point, the writings of Mr. Lawrence will tend to dispel a great deal of prejudice.—See Med. Chir. Trans., vol. xiii.—Ed.

* In John Hunter's theory of inflammation, the increased size of the arteries is conceived to depend upon a diminution of the muscular power of these vessels. In this respect, though in few others, there is an approximation of Vacca's doctrine to the Hunterian view of the subject. While John Hunter ascribes the increased flow of blood to and through inflamed parts to the dilatation of the arteries, some other pathologists explain the fact by

I have said that there is something highly plausible in this hypothesis *at first sight*. Beyond this, however, its plausibility does not proceed; and hence these respectable authorities, while they agree in the main principle of diminished action of the capillary arteries, differ widely concerning the actual state of the vessels, and particularly upon the question whether the velocity of the fluids they contain is diminished or accelerated.* Let these effects, however, be as they may, the hypothesis, as it appears to me, equally fails in accounting for the heat, and the soreness or pain, which are essential characters of inflammation, and which accompany it from its commencement.

The augmented heat is accounted for by the accumulation of a larger proportion of blood. But a mere accumulation of blood can produce no such effect. Its natural temperature is 98° of Fahrenheit, and, however it may be congested, it cannot, without some other change, give forth a heat of 99° or 100°. In the exercise of walking or running, the increased heat produced is the result of increased action, and, so far from being that of increased accumulation of blood, the heat continues to augment as the blood, in conjunction with the other fluids of the body, continues to diminish. The soreness or pain is ascribed to the distention. But distention in vessels or organs of any kind that are in a state of relaxation, and possess little contractility, produces no pain or soreness even when carried to an extreme; while, in the case before us, these symptoms, as just observed, show themselves from the first, and are even most severe when the distention is least of all.

But, independently of these objections, both the exciting causes and the treatment of inflammation seem far better to coincide with the idea of redundant than of defective action; and the case upon this point is put so candidly by Dr. Bostock (*Physiology*, p. 426), that the reader will thank me for substituting his words for my own. "All those circumstances," says he, "which we are usually in the habit of considering as stimulants, excite inflammation; and where the same effect is brought about by sedatives or by agents of a more powerful operation, still we can generally perceive the existence of what has been termed reaction, which is the immediate precursor of the change in the state of the circulation. In the same way, the remedies for inflammation appear to me to be more adapted to remove or relieve an excess than a defect of vital energy, as for this purpose, except under peculiar circumstances, we always apply either direct or indirect sedatives, and find stimulants to be as injurious as the others are beneficial. For these considerations I am induced to recur to the former idea of increased action being the proximate cause of inflammation, or, at least, as being essential to it, and to inquire whether there be no correct method of combining a state of increased action with distention of the vessels."

In the prosecution of this inquiry, Dr. Bostock observes, that the distention must be produced by an obstruction of some kind or other, and he suggests that the cause of such obstruction may be derived either from the contained fluid, or the containing vessels. The first he seems to think may be produced by an actual increase of fibrin, or a greater tendency in its usual proportion to coagulate, occasioned by the inflammatory action itself; or by some new arrangement in respect of sanguineous globules, so that they may coalesce, or be more strongly attracted together. And the second may spring from a relaxation in the minute arteries, augmented in proportion to the vigour of their contraction, so as to admit the fibrin and the globules of the blood into vessels which have hitherto been impervious to them, where they must necessarily become impacted from a vis à tergo on the one hand, and the decreasing diameter of the minuter vessels opened into on the other.

Future experiments and inquiries may find no

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the great power of contractility in the minute ramifications of these vessels. Yet many of the small arteries are plainly discerned to be increased in size, and, in certain stages of inflammation, the motion of the blood in them, instead of being quickened, is retarded. Great obscurity prevails, however, respecting the exact state of all the vessels, and the circulation through them in inflammation; and though some be enlarged, and more or less obstructed with stagnant blood, certain facts tend to prove, that, at all events, there is an augmented determination of blood to an inflamed part, and a greater return of blood from it. It is by the capillary arteries, "that the functions of nutrition and secretion are performed, and it is absolutely necessary for the uniform and uninterrupted accomplishment of these varied and highly important functions, that they should have the power of controlling the motion of the fluid circulating within them. The relative momentum of the blood in different parts of the body, or the quantity of blood and its velocity, are perpetually varying from the influence of external stimuli or internal causes; and this variable state of the momentum of different portions of the arterial system is a decisive proof of the vital contractility of its vessels. We thus observe the minute vessels of the cheek, in the act of blushing, acquiring increased activity, and admitting more blood; while, under the influence of depressing passions, such as fear, they are suddenly emptied, and the countenance becomes pale. Local inflammation is stated by all pathological writers to be characterized by a rapid throbbing pulsation of the vessels in the part affected, while the action of the heart and arteries of other parts of the body may not be increased. If a person, having an inflammation in one hand, be blooded in both arms at the same time, twice or thrice as much blood will flow from the diseased side as from the other."—(See Cyclop. of Pract. Med., art. INFLAMMATION.) Whatever may be our theory of the proximate cause of inflammation, whatever may be our view of the exact state of the vessels of the inflamed part, and the circulation in them, we must admit, that more blood is propelled to it, and a greater quantity returned from it, than in the natural state.—ED.

* This is now known to depend very much upon the stage of inflammation; at first the velocity of the blood in the part affected is generally increased; but, afterward, if the disorder make progress, the blood moves more slowly than in the healthy state, or even becomes stagnant.—ED.

small degree of truth in the one or the other of these suggestions. But, it should not be forgotten, that increase of action by no means necessarily imports increase of strength, and that the motific or contractile power communicated to the muscular fibres never flows, even in a state of health, in a continuous or interrupted tenor, but with an alternation of jets and pauses. Upon this subject we shall treat at some length when examining the morbid actions of the nervous system, as well in the Proem to that class as under several of its subdivisions, particularly the genus CLONUS, or CLONIC SPASM (Cl. IV., Ord. III., Gen. II.); where we shall show that, in weakly habits, in which a morbid increase of nervous action must frequently take place, the more violent the jet, and consequently the contractile effect that ensues, the more prolonged and complete the alternating pause, and consequently the relaxation in the same fibre; excepting in cases of rigid or entastic spasm, which will be explained in its proper place. And hence the very fact of increased contraction paves the way for a subsequent and alternating dilatation, and this too in proportion to the violence that the contraction exhibits; since the stream of nervous power, thus communicated by jets from the sensorial fountain, is expended instantaneously, and before the next supply arrives. This must be the result in all cases of inflammation, whether the part affected or the whole constitution be in a state of atony or of entony. But, as we have already shown that inflammation far more generally takes place in the former than in the latter; and as we have shown also, that the capillary vessels in which inflammation seems to commence, are endowed with a far higher proportion of contractile power than the larger arteries, it must follow, that the morbid irregularity of action which exists of necessity in the vessels of an inflamed part, by such sudden and alternate exhaustions of contractile power, and consequently such intervening periods of rest and relaxation, must lay a foundation for distention; the posterior current of blood now rushing forward, almost without resistance, into the inflamed part; where, also, it must accumulate, as, in the same vessels, beyond the inflamed limit, there is no such morbid rest and relaxation, and consequently a continuance of the uniform resistance of a healthy state. And when to these facts we add also the necessary intermission of the globular and larger corpuscles of blood into vessels whose ordinary diameter is too small to receive them, we can be no longer at a moment's loss to account for the phenomena of an enlargement of the inflamed vessels, and a distention of the inflamed part.*

Concerning the proximate cause of inflammation, however, there is yet much to be unravelled. Of its remote causes, and a few of its laws, we are in some degree better informed The remote causes may be contemplated under the three following divisions:

First, some accidental violence applied to a part, so as to make a wound or bruise, from which it cannot recover except by the process of inflammation, or which, at least, has a natural tendency to excite such a process.

Secondly, some irritation which does not destroy the texture of the part, but merely its natural action; as pressure, heat, cold, blisters, pungent applications, and often fevers of every kind.

Thirdly, a particular disposition to inflammation, founded, perhaps, as we have just observed, on an irritability in the morbid part itself, and which we often behold in constitutions of the best state of health; affording proof, that the general habit is not, in such cases, concerned in the morbid change. Inflammations from any of these causes will, however, partake of the character of the constitution; and hence proceed kindly or unkindly, according as the constitution is in a diseased or a healthy condition. Yet the general principle of inflammation is the same in all; for we can only contemplate it as a remedial process, an instinctive effort or exertion of the vis medicatrix naturæ, to bring about a reinstatement of the parts nearly to their natural functions.

Yet, though inflammation is uniformly the same in its principle, it often differs widely in its mode of action, and consequently in its result; for, as it has a tendency to partake of the character of the constitution, and especially where it is extensive, according as the constitution is healthy or unhealthy, so will be the nature of the inflammation and the diversity of its progress.

Healthy inflammation consists probably of one kind alone, and is no farther divisible than into different stages of a restorative action, the effect of an instinctive stimulus, rather than of morbid irritation. Unhealthy inflammation consists of many species; for, numberless are the diseases that affect the health of the constitution; and, consequently, that may influence the character of the inflammation, by superadding peculiarities or specific actions of its own: though it is often affected also by the particular condition of the part in which the inflammation

* From the experiments and microscopic observations of Dr. W. Philip, Dr. Thomson, and Dr. Hastings, it appears, that in inflammation the small vessels, veins as well as arteries, are dilated. The increased action of the minute arteries, so generally and vaguely spoken of as the cause of inflammation, may be a convenient expression; but, when it is to be employed for the purpose of really illustrating the nature of inflammation, an exact definition of its meaning should always precede its use. Thus, if it be understood as implying an alternate increased contraction and dilatation of the minute arteries of an inflamed part, proofs of the fact are wanting. No such motions of the minute arteries in inflammation have ever been seen with the microscope. It was a meaning, also, never entertained by Mr. Hunter; who, when he speaks of the increased action of the arteries in inflammation, appears to signify, among other changes, a dilatation of them, attended with a diminution of their contractile or muscular power. Dr. W. Philip's researches lead him also to conclude, that the dilated capillaries are in a debilitated state.—Ed.

takes place. And hence it is no uncommon thing for particular parts to run into particular inflammations, with the character of which the constitution has little concern; such as those that are occasionally found on the skin, particularly the erysipelatous, as they are commonly, but not quite correctly, denominated, and which we shall presently have to describe under the name of erysipelatous erythema.*

Simple or healthy inflammation is capable of producing three different effects, which, where the whole take place healthily, follow in regular order, and constitute so many stages. These are, adhesions of the parts inflamed, suppuration, and ulceration; to which three different effects Mr. Hunter has given the names of the adhesive, the suppurative, and the ulcerative inflammation.†

There is good reason for this division into different heads; for although, where the whole takes place healthily, they follow in the order now enumerated, yet the whole do not always take place either healthily or unhealthily, nor is the order thus enumerated in every instance attended to. For pus, as we shall have occasion to observe more largely hereafter, is often produced where there is no adhesive inflammation; and ulceration, where there is neither adhesion nor suppuration; while occasionally the suppurative and adhesive inflammations take place simultaneously; the former being hurried on before the other has completed its own bounds, as is often the case in peritoneal inflammation after childbirth. The degree of violence also with which the inflammation commences, produces a considerable influence upon these points; and the nature of the parts themselves still more.

With the nature of the parts that constitute the chief fields of inflammation, it is of high importance that we should make ourselves deeply acquainted from the first, that we may be able to determine concerning the particular course the inflammation is likely to run, and regulate our treatment accordingly. And it is of still farther importance that this subject should be attended to on the present occasion, because it is on this distinction of parts, producing a natural tendency to distinct inflammations, that the genera of the order before us are principally constructed.

The whole of the observations of Mr. Hunter upon this interesting point are entitled to the most patient study, and cannot be too closely committed to memory. In the present place, I can only remark, that, in treating of inflammation, he divides the body into two parts: firstly, the circumscribed cavities, organs, and cellular membrane which connects them; and, secondly, the outlets of the body, commonly called mucous membranes, as the ducts of the glands, alimentary canal, and similar organs. He distributes inflammatory affections, as I have just observed, into three sorts; adhesive, suppurative, and ulcerative. Adhesive inflammation belongs chiefly to the former of the above two parts of the body, *where they are deeply seated*, and appears intended to take place for the purpose of preventing suppuration. It applies, therefore, peculiarly to that genus of the present order which we shall denominate EMPRESMA, and which will embrace the visceral organs, allowing for one or two exceptions that are occasionally interposed. Suppurative inflammation belongs chiefly to the same division of parts *placed near the surface*; and consequently applies to the two genera here denominated PHLEGMONE and PHYMA, embracing small cutaneous abscesses of various kinds. The ulcerative inflammation belongs chiefly to the second order of parts, as the mucous and serous membranes and outlets; and hence applies principally to the genus ERYTHEMA, or INFLAMMATORY BLUSH; often, but improperly, called erysipelas, which is an exanthem or eruptive fever, accompanied with erythema. It also applies to that peculiar inflammation which characterizes the whitlow, and will be found in the present arrangement under the genus PHLYSIS. Deep-seated suppurative inflammations and abscesses cannot well be placed in either of the genera we have thus far noticed, and have a claim to be considered by themselves. They are hence included in the genus APOSTEMA, with which the order will be found to open.

In circumscribed cavities, where from a peculiarity of constitution, or the peculiar nature or degree of excitement, an inflammation is deflected from its common tendency to produce adhesion, we often find it run on with great rapidity from one part of the cavity to another, till the whole becomes affected. We have already had occasion to notice this inflammation of the peritoneum (Cl. III., Ord. I., Gen. VI., Spe. 3); and we shall have further occasion to notice it in psoas abscess (Cl. III., Ord. II., Gen. I., Spe. 2) and acute rheumatism. And we may hence account for the alarming progress of the same morbid action when it attacks the surface of arteries or veins, from an accidental wound, as in venesection, from true aneurism, or from any other cause; of which acute rheumatism seems, at least, occasionally to be one. The French writers, who have studied the sub-

* Erysipelas is probably always connected with some constitutional derangement or peculiarity. In that form of it which is preceded by fever, this is manifestly the case. That persons who lead intemperate lives are more frequently affected with erysipelas than other subjects, is familiarly known to all practitioners. Atmospheric causes also, by their influence on the constitution, make erysipelas often prevalent in particular seasons and districts.—Ed.

† This account of adhesion, suppuration, and ulceration, *following* "*in regular order*, where the whole take place healthily," cannot be received as correct. Adhesive inflammation often prevents both the other consequences. Yet, you may occasionally see the adhesive, suppurative, and ulcerative forms of inflammation, and even gangrenous mischief, exemplified at different points of the same disease. Suppuration sometimes precedes and leads to ulceration, by the agency of which the pus gains an outlet; but, frequently, the ulceration is the forerunner of suppuration, a chasm is formed in the inflamed tissues, and then the secretion of a puriform fluid begins.—Ed.

ject with considerable attention, are disposed to regard these inflammations as in many instances idiopathic, and have distinguished the former by the name of ARTERITIS.* But I am not aware of their having hitherto been found to occur otherwise than as concomitants or sequences of other affections.

The inflammation of veins, by some writers called PHLEBITIS, has of late occupied more attention than that of arteries. It is occasionally a result of an irritated varix, and especially where such varix has undergone the operation of removal, as we shall further observe when treating of this complaint (Cl. III., Ord. IV., Gen. XI., Spe. 2); it has also occasionally followed venesection where the lancet has been affected with rust or some other irritant; and especially where the constitution, or perhaps the vein alone, has been in a state of morbid irritability. And it has sometimes occurred where no distinct cause could be assigned, either during life, or on dissection afterward. It is by no means easy, and for the most part altogether impossible, to trace an inflammation of a vein or artery by external sighs; for although, in the former, there is sometimes a red streak or two accompanying the general pain and swelling of the limb, and in the latter a more rapid pulsation or throbbing, and in both a line of hardness like that of a cord; yet, in various cases, nothing of the sort is to be found, and consequently they cannot be regarded as pathognomonic criteria. And, on this account, the author has allotted no distinctive place or name to these affections in the course of his classification; as feeling that to do so would be to make an empty display, and a verbal subdivision unattended with any real use. In a striking case which proved fatal, described by Dr. Duncan, the disease was so little indicated by either the general or local symptoms, that it does not seem to have been suspected, and was only accidentally discovered on a post-obit examination. At the time when the symptoms were most aggravated, and less than twenty-four hours before death, when the swelling had extended up the arm, and the pulse was at 120, the limb had a uniform appearance, the intumescence a defined margin, "but still without much redness, heat, or pain, unless in a point at the bend of the arm on considerable pressure, and on the outside of the elbow."† A knowledge, however, of the precise fact could have made little or no difference, nor ever can do so, in the mode of treatment, which must uniformly be founded upon the general process for diffuse inflammation, whether more or less complicated in its range.

It is on this account that Dr. Duncan has rather chosen to regard such wide-spreading phlogoses, whether of veins, fasciæ, tendons, or lymphatics, as mere modifications of what he has specifically called "Diffuse Inflammation of the Cellular Texture" (op. cit.), which, in truth, is in almost every instance more or less affected, and, in many instances, with gangrenous suppuration that knows no bounds. Perhaps this may be to generalize rather too much, and especially in the case of that very singular and more definite description of inflammation which takes place from contagion absorbed by a sore or wounded part in dissecting, and which the present author will be found, therefore, to have separated for a particular investigation under the name of ERYTHEMA *anatomicum* (Cl. III., Ord. II., Gen. IV., Spe. 5); but he is well aware of the difficulty of making even this distinction; and of the tendency there is for the diffuse kind of inflammation we are now considering to run into every form, exhibit every variety of combination, be conjoined with every type of fever, and productive of every diversity of danger, from the peculiarity of the general or the local constitution, the influence of the patient's habit of life, or some other incidental predisponent or concomitant.

Inflammation, therefore, is influenced by the nature of the part in which it takes place. It is also, as we have already observed, equally influenced by the nature of the constitution itself; and, thirdly, it is influenced by the nature of the remote cause. And we may add, that, where the inflammation is regulated by the constitution, and the constitution itself is healthy, specific irritants will not change the nature of the inflammation, but only determine its situation, extent, duration, or some other peculiar property. But where the constitution is unhealthy, or predisposed to any particular morbid action, as that of erysipelas, putrid fever, or plague (for some individuals receive even the plague much more readily than others), as soon as the specific virus is communicated, the disease will degenerate into a mixture of both, and discover its double source; it will give proof that a specific inflammation has been set down upon a constitution of a peculiar kind, and will partake of the nature of both. In consequence of which, the specific properties will by no means be so distinct or well formed as if they were to appear in a sound and untainted constitution.

Thus, if the constitution have a tendency to fall into a state resembling that of typhus fever, and the smallpox attack it, the inflammation will be that of the smallpox combined with the constitutional disposition to typhus; which will so far affect the action of the smallpox as to interfere with the specific difference of its inflammation. In consequence of which, the pustules will spread, but not suppurate, and assume a livid hue, and perhaps prove fatal; while, if another person, possessing an uncorrupt, and, so to speak, unbiased constitution, be inoculated even with this mixed virus, the variolous

* See Enecia Cauma, Cl. III., Ord. I., Gen. IV., Spe. 1; as also Arthrosia Acuta, Cl. III., Ord. II., Gen. XII., Spe. 1; and Cl. III., Ord. IV., Gen. X., Spe. 2, Exangia Varix. The gangræna senilis, or dry gangrene of elderly persons, is ascribed by Baron Dupuytren to the effects of arteritis.—ED.

† Case of an inflamed Vein, Trans. Medico-Chir. Soc. Edin., vol. i., p. 443, 8vo., 1824. The later observations of Rose, Arnott, Cruveilhier, Andral, and others, have thrown considerable light on the nature of phlebitis. The researches of Cruveilhier, in particular, are of great value.—ED.

principle will separate itself from the principle with which it is combined, improve with the improvement of the new soil, and yield a crop of genuine and unadulterated pustules.

In like manner, vaccination is, generally speaking, a specific preservative against the smallpox. But it sometimes happens that it is not so, and that the smallpox is caught and makes its appearance many years after vaccination has been performed with all possible circumspection. And it generally happens in such cases, though not always, that a mixed or hybrid disease, a sort of degenerate smallpox, of a milder character than the true, is hereby produced.

The remarks just laid down will furnish us with a clear and sufficient clew to these singular and interesting facts. Some persons have a peculiar predisposition to smallpox, which is by no means easily eradicated, and far less so than in others. Vaccination, which permanently counteracts the predisposition among mankind in general, does not permanently counteract it here. It introduces a new but less rooted diathesis, and the former is rather suppressed than extirpated. In process of time the predisposition revives, reacquires its anterior influence, and the moment it comes in contact with variolous contagion, subjects the system to smallpox. But while the variolous diathesis is thus again predominant, the vaccine diathesis has not altogether lost its hold; and the disease, as in the preceding cases, is a mixed product of both causes in co-operation, or rather in antagonism. It is smallpox, raised upon a constitution not yet totally liberated from the influence of vaccination; I say, "not yet totally liberated," because we occasionally meet with instances in which the constitution, little open to the impression of the vaccine disease, even when first communicated, becomes in time liberated from its influence altogether, and receives the smallpox, after vaccination, as freely as if it had never been vaccinated, and with a violence that proves fatal in a few days.

It is a wise and beneficent law of Providence, and affords an incontrovertible proof of the existence of an instinctive remedial power, that inflammation, wherever seated, is always more violent on the side of the inflamed point nearest the surface, and shows a constant tendency to work its way externally rather than internally. This law applies equally to the thorax, to the abdomen, and to parts which lie close to the different outlets of the body. Thus, if an inflammation attack the peritoneum covering an intestine, and adhesions are hereby produced between the two, the inflammatory action works upwards through the thick walls of the abdominal muscles, while the proper coats of the intestines, in most instances, remain sound. This, indeed, is not always the case; for the inflammation may be so violent as to pass in both directions with great rapidity, or some accidental circumstance may force it inwardly; but it is so common as to form a general rule. We see the same thing in the obstruction of the natural passage of the tears producing a fistula lachrymalis; for here the ulceration points externally to the inner angle of the eye, while the inside of the nose defends itself by becoming thicker; so much so, in many cases, as to block up the cavity of the nostril, and produce inosculations with the septum; which has been an occasional cause of failure in the usual operation for this disease. —(*Hunter on Blood, Inflammation*, &c., part ii., chap. ix.) We even find, that, if an abscess form in a frontal sinus from an obstruction in its duct, the matter will rather work its way externally through the frontal bone than descend into the nose. In like manner, if an inflammation attack the cellular membrane on the outside of the rectum near the anus, although the latter be in contact with the inflamed part, the inflammation will extend to the skin of the buttock, while the gut itself is often but little affected.

For the same reason, we behold eruptive fevers conducting the specific poisons which excite them, as smallpox, measles, rosalia, or scarlet fever, and even the plague itself, to the surface of the body, rather than throwing them on parts that are deep-seated and vital. The cancer is said to form an exception; but even here the progress of the disease towards the surface is quicker than its progress towards the centre; while syphilis exhibits something of a similar disposition, though not in an equal degree.

It appears, then, that simple or healthy inflammation is a remedial process for restoring a part to soundness when affected by a morbid impression that has a tendency to injure or destroy it; and that the first stage of this process consists in the effusion of a coagulable lymph, which binds the weakened organization into a closer bond of union, creates new vessels, and consequently introduces new life. If this effort do not succeed, and the morbid action still continue its progress, the affected part dies to a certain extent; but the coagulable lymph which has been thrown out, and introduced new vascularity around it, still sets a boundary to the destructive career, and prevents it from spreading into the neighbourhood, or at least from spreading as far as it otherwise would do. When, however, a part is thus killed or destroyed, it becomes a substance foreign to the body, and must be removed, and have its place supplied by a formation of new living matter. The process of suppuration, which we shall explain under the genus APOSTEMA, prepares equally for the removal of the dead matter and the formation of that which is to fill up its post. This, however, is the progress of healthy inflammation alone; for, as already observed, in unhealthy inflammation, the morbid action will often run on to the ulcerative process, or last stage, at once; or the adhesive, or the suppurative, may intermix with it; or all may imperfectly take place together.

In attempting the cure of inflammation, our first endeavour should be to obtain what has been called a resolution of the general enlargement; or, in other words, a restoration of the part to its state of former health, without the necessity of its going through the entire range of the inflammatory process. And, in doing this, we are to be guided by the principle of being

able to make a new impression upon the part, and to oppose a healthy or remedial, to an unhealthy and mischievous action. The nature of the cause must hence be sedulously inquired into: for, till this is ascertained and removed, it will be in vain to expect that resolution can take place, and, where we can speedily accomplish such removal, resolution will often follow spontaneously; for the animal economy, having a disposition in itself to discontinue diseased action, such action will readily subside upon a disappearance of the cause that maintains it. And hence, by taking off the venereal action by the use of mercury, in the case of a bubo, the inflammation will gradually cease, provided no other morbid action has already arisen and united itself with the syphilitic.

Resolution, however, is not always to be attempted; for there are many cases in which the attempt would be in vain, and possibly a few in which it would be improper. It is not to be attempted in accidents, where there is a considerable exposure of the injured part, and still less in accidents where the part has been killed by their violence; for in these suppuration is the first natural step to a cure, and we cannot prevent it if we would.

Where inflammation arises from a morbid predisposition in the constitution, and belongs to the description which has been called critical, there is some doubt, and much demand for circumspection: and in this case, resolution is called repulsion. If the inflammation be really a concentration of the constitutional complaint, which, by being driven from the part fixed upon, may be again diffused over the entire frame, and in waiting to fasten on some other part, it will often be better to encourage its stay. But the determination, even in this case, must be subject to the two following conditions: first, that the inflammation, so concentrated, will readily admit of a cure; and next, that the part on which it fixes is not of vital importance; for, otherwise, the remedy may prove worse than the disease.

When resolution is determined upon, independently of removing the cause of the inflammation, we may advantageously follow up its effects by all the common modes employed for this purpose, according to the nature of the particular case. The undue degree of action may be diminished by bleeding and purging; the distention by local applications that tend to contract the diameter of the vessels, as cold, and metallic or other astringents; and if along with the distention there should be great pain, narcotics and relaxants will generally be found useful auxiliaries. To these in the present day are often added nausea and vomiting; the former of which operates by lowering the action of the vessels, the latter by giving a tendency to a new action. The nature of the case must determine our choice.*

* To these remedies should have been added mercury, one of the most powerful means of counteracting many forms of inflammation: perhaps, next to bleeding, it is the most important means which the practitioner can avail himself of in the treatment of the generality of visceral inflammations.—Ed.

GENUS I.
APOSTEMA.
APOSTEME.

LARGE SUPPURATIVE INFLAMMATION IN A DEEP-SEATED ORGAN; PUS COPIOUS AND CONFINED.

The term APOSTEMA is Greek, from ἀφίστημι, "discedo," "abscedo,"—whence the Latins employed ABSCESSUS, to express the same general idea. Yet they did not, strictly speaking, apply either abscessus or apostema to every suppurative inflammation, but only to those that were deep-seated, and of considerable extent; chiefly, indeed, to collections of pus consequent upon fevers, or some previous disorder of particular parts, especially abdominal diseases. This limitation is accurately drawn by Celsus immediately after his description of struma, furunculus, and phyma. "Sed cùm omnes hi nihil nisi *minuti abscessus* sint, generale nomen trahit *latius vitium ad suppurationem spectans*. Idque ferè fit aut post febres, aut post dolores partis alicujus, maximèque eos qui ventrem infestarunt."—(Lib. v., cap. xxviii., § 11.) The term *abscess*, however, which was colloquially used in a loose sense in the time of Celsus, is used so much more loosely in our own day, that it is impossible to recall it to its precise and original meaning. Yet APOSTEMA has not been thus generalized; and it is here, therefore, laid hold of and restrained to the signification expressed in the generic definition; after the authority, indeed, of Sauvages, who has employed it with the same limitation.

The genus apostema, in the arrangement before us, will be found to include five species: the first of which is common to most fleshy parts, and possesses a common character; while the remaining four are distinguished by some peculiarity of character, attributable to their situation.

1. Apostema Commune. Common Aposteme.
2. ——— Psoaticum. Psoas Abscess.
3. ——— Hepatis. Abscess of the Liver.
4. ——— Empyema. Lodgment of Matter in the Chest.
5. ——— Vomica. Vomica.

SPECIES I.
APOSTEMA COMMUNE.
COMMON APOSTEME.

INFLAMMATION COMMON TO THE FLESHY PARTS: PAIN OBTUSE: TUMOUR SPREADING EXTERNALLY: TENDER TO THE TOUCH; PUS LAUDABLE: READILY INCARNING WHEN OPENED.

In whatever part an aposteme is seated, it will sometimes spread to a wonderful extent, and be loaded with a prodigious weight of pus. M. Balme gives us an account of an abscess that extended through the whole parietes of the chest and abdomen on one side, and reached from the scapula to the thigh (*Journal de Médecine*, &c., tom. xvii.); and Hildanus was present when, upon opening a patient after death, twelve pints of pus were found effused from a

visceral apostеme into the cavity of the abdomen.*—(Cent. ii., obs. 57.)

In all such cases, the first stage of inflammation, that of adhesion, must have been overshot in the violence of the action, or from some other cause the suppurative and ulcerative have commenced simultaneously from the first. For otherwise, the coagulable, or, as Mr. Hunter prefers to call it, the coagulating, lymph thrown forth, as has been already explained, into the cellular membrane in the earliest stage of the inflammation, would have formed a boundary wall, by the production of new vessels and reticulations, much nearer to the salient point of inflammatory action, and confined the secretion of pus to a much narrower limit.

The secretion of coagulable lymph, and the reticulate adhesion and formation of new vessels which issue from it, is indeed designed, as has been explained already, to prevent the necessity of the suppurative and ulcerative stages of inflammation; and the natural cure of the adhesive stage is by resolution.

When, therefore, an apostеme takes place in a healthy frame, or, in other words, when the inflammation passes into the two ensuing stages of the suppurative and ulcerative, and pus is formed, and a cavity scooped out for its reception, we are to take it for granted, that the instinctive and remedial power of nature is incapable of producing a cure by the first intention; that some dead part or extrinsic substance is required to be removed,† and that the two ensuing stages of inflammation are had recourse to for this purpose.

In the formation, then, of an apostеme in a healthy constitution, we are to suppose that some part of the organ in which inflammation occurs, as, for example, a piece of the muscle of an arm or a leg, is become dead, and an incumbrance to the living parts that surround it, instead of assisting in their office. In effecting, therefore, the important object of a cure, it is obvious that two distinct actions are necessary; the dead part must be carried off, and the loss must be filled up by a substitute of new matter possessing the precise properties of the old. And, in the process which takes place to accomplish these two purposes, we meet with another clear and striking instance of that wonderful instinctive power which pervades every portion both of the animal and the vegetable world, and which is perpetually stimulating them to a repair of whatever evils they may encounter, by the most skilful and definite methods.

In order to comply with this double demand of carrying off the dead matter, and of providing a substitute of new, the absorbent and the secernent vessels in the living substance, immediately surrounding that which requires to be removed, commence equally, and nearly at the same time, a new mode and a new degree of action. A boundary line is first instinctively drawn between the dead and useless, and the living and active parts; and the latter retract and separate themselves from the former, as though they had been skilfully divided by a knife. This process being completed, the mouths of the surrounding absorbent vessels set to work with new and increased power, and imbibe and carry off whatever the material may be of which the dead part consists, whether fat, muscle, ligament cartilage, or bone; the whole is equally sucked up and taken away, and a hollow is produced where the dead substance existed.

While this is proceeding, the mouths of the correspondent secernent vessels from the first, and perhaps somewhat antecedently, commence a similar increase and newness of action; and, instead of the usual fluid, pour forth into the hollow a soft, bland, creamy, and inodorous material, which progressively fills up the cavity, presses gradually against the superincumbent skin, in the gentlest manner possible distends and attenuates it, and at length bursts it, and exposes the interior to the operation of the gases of the atmosphere. From this period the process of incarnation commences: granulations of new living matter pullulate on every side, assimilating themselves to the nature of the different substances that are lost, till the hollow is sufficiently filled up, and the organization completely regenerated.

On the bursting of an abscess externally, we occasionally find that a portion of the dead matter still remains, which afterward gradually sloughs away, or is thrown off by a separation at its base. This is particularly the case in furuncles or biles; and still more strikingly so in large abscesses that include bones, or the tendinous parts of muscles, which are more difficult of absorption, though even these are sometimes absorbed and completely carried off.

The attenuation of the superincumbent integuments of an abscess appears to be produced by the stimulus of distention, occasioned by the pressure of the accumulating pus. And it is to the same stimulus that Mr. Hunter refers the absorption of the dead matter itself; conceiving,

* In the New-York Medical Journal, No. iv., p. 293, Dr. David L. Rogers, of New-York, has given the details of two interesting cases of abdominal abscess in which he operated in the usual mode of operating for hernia at the internal ring; in both cases, large quantities of pus were discharged, and the patients recovered. Dr. R. thinks, and justly, that abdominal abscesses are overlooked, in many cases, when the existence of matter in some part of the abdomen might be detected by close observation, and by a timely discharge of it the patient might be rescued from danger.—D.

† The removal of "some dead part, or extrinsic substance," is not an essential circumstance in the formation of an abscess. The purulent matter is more commonly only interposed between parts, or diffused in their tissues, which are not to be looked upon as absolutely destroyed. It is chiefly on the principle of distention that the pus forms a cavity for itself; and frequently, very soon after the abscess has been discharged or burst, the parts appear to be all perfect again, none of them being deficient. There may be, however, in some instances, sloughing combined with suppuration; but these are not common apostemes; and, very generally, in a certain stage of the disease, ulceration takes place in order to bring the matter through the parts intervening between it and the cuticle.—ED.

that, for this purpose, the secretion of the pus commences somewhat earlier than the absorbent process.

The formation of pus, and consequently the existence of an aposteme, are evidenced by a cessation of the pain of distention, which gives way to a throbbing pain, synchronous with the dilatation of the arteries; and by irregular shiverings, and sometimes rigour. After a few days, a weight is felt in the part, the throbbing pain itself subsides, the tumour becomes soft, and, if it point sufficiently towards the surface, fluctuates to the touch.

There is some doubt to whom we are indebted for the first insight into this wonderful process; for it was taught at the same time, or nearly so, on the continent by De Haen, Plenciz, and Schroeder, and, in our own country, by Hewson, Hunter, Home, Cruickshank, and Professor Morgan, but, upon the whole, Mr. Hewson appears to have taken the lead, and the rest to have followed closely in his steps.* Antecedently to which period, pus, instead of being a peculiar secretion, was supposed to consist in a dissolution of the bloodvessels, nerves, muscles, and other solids, in the ordinary exhaling fluid when augmented by effusion; or in a conversion of the serum, thrown forth on the occasion, into the new matter, by a change effected in its gluten during its state of stagnation: the first of which hypotheses was that of Boerhaave (*Aphor.*, 387), Platner (*Instit. Chirurg.*, sect. liv.), and almost all who practised antecedently to their time: and the second that of M. Gaber (*Acta Taurinensia*, vol. ii.), and Sir John Pringle.†

These conjectures were ingenious, but they were nothing more; and their errors are sufficiently pointed out in the "Experimental Inquiries" of Mr. Hewson, to whom physiology, and especially the science of morbid anatomy, is almost as much indebted as to any person whatever. He travelled, with a comprehensive mind, and a zealous and indefatigable step, in what was at that time new and untried ground; and, though he was mistaken in a few points, he correctly explored much, and, by the course he laid down, indicated to his successors the truest methods both of confirming his facts and correcting his misconceptions.

He proved decidedly that pus is a peculiar secretion, and that it is often, indeed, secreted where there is no abscess or breach of surface; and he ingeniously accounted for its production by supposing it to be formed out of the coagulable lymph by a new power, given to the secernent vessels in consequence of the inflammatory action. "And if pus," says he, "in these cases, is produced merely by a secretion, so likewise it would seem probable that even in abscesses, where there is a loss of substance, it is not the melting down of the solids that gives rise to the pus, but the pus being secreted into the cellular membrane from its pressure, and from other causes, *deadens the solids and then dissolves* them."—(*Experimental Inquiries*, part ii., p. 118.)

The idea of the solids contained in an abscess being deadened and dissolved by the pus which surrounds them, in the ordinary sense of the expression (for in one sense, as will appear hereafter, they may be said to be dissolved), was one of the erroneous opinions of Mr. Hewson to which I have just alluded; and originated from too close an adherence to the earlier and still more mistaken hypothesis we have just noticed.

And hence, with all his ingenuity, Mr. Hewson advanced not much more than half way in explaining the entire economy of suppurative inflammation. It remained for the exploring eye and commanding genius of Mr. Hunter to penetrate through a considerable portion of the re-

* Dr. Morgan, of Philadelphia, seems to have anticipated Mr. Hunter. In his inaugural thesis at Edinburgh on the formation of pus, printed in 1763, he contended for the doctrine that pus was a secretion.—D.

† Treatise on the Diseases of the Army, App. —Laennec and Gendrin are induced by their researches to consider suppuration as the result of a direct conversion of the coagulable lymph of inflammation, and of the fibrine of the blood, into pus. Laennec believed pus to be simply softened coagulable lymph. This is proved by analysis to consist, not only of the fibrine of the blood, from which it differs by its lesser consistency, but also of a small proportion of albuminous serum. It is supposed, therefore, to be formed of an intimate combination of the fibrine of the blood with a small proportion of albumen, rendered more viscid and coagulable by the vital influence of the inflammatory action, and deprived also of the colouring matter. The opinion that pus is formed directly from the blood by the fibrine simply undergoing some slight modifications in its properties during inflammation, is supported by various interesting experiments, detailed by Gendrin.—(Hist. Anat. des Inflammations, vol. ii., p. 470; Cyclop. of Pract. Med., art. Inflammation; and Andral, Anat. Pathol., tom. i., p. 397.) In the Museum of the University of London is a heart which contained a coagulum, in the centre of which was found a collection of pus. Andral maintains throughout all his pathological observations the theory of the blood having the power to form pus, even within the vessels of the living body as well as out of them.—(Anat. Pathol., tom. i., p. 388.)

Suppuration is certainly not always merely the conversion of a mass of extravasated blood, or coagulable lymph, into pus; for it takes place both on the surface and in the interior of inflamed organs by a process analogous to secretion, through the medium of vessels either previously in existence, or newly formed. It constitutes in this manner a new function, which sometimes lasts for a considerable period after the inflammation has subsided, as is seen in fistulous sinuses, chronic ulcers, &c. When pus is found in the vascular system, or in the blood itself, sometimes the veins containing it are returning from parts in which there are abscesses; but sometimes also without the latter occurrence. In cases of phlebitis, the formation of matter in various organs, viscera, and even the synovial membranes, more or less distant from the original mechanical injury or inflammation, is a subject which has of late years been investigated in a most interesting manner by Rose, Arnott, and Cruveilhier. The reader will find some views of the theory of suppuration, published by Dr. Benjamin Babington, well deserving of attention.—Ed.

maining half of this curious process, and to prove that the solid parts contained in the area of an abscess, instead of being deadened by the pressure of the surrounding pus, are dead beforehand, destroyed indeed by the violence of the accident or of the inflammation; and that, instead of being merely dissolved in the circumambient pus, they are absorbed and carried off by a new and increased action of the circumambient absorbents; thus showing, that even ulceration itself, when of a healthy kind, is only another link in the restorative chain of nature, made use of on this occasion.

That pus, instead of being a mere solution of dead animal matter, is a distinct and peculiar secretion, is now known to most practitioners from personal observations, who must have witnessed it repeatedly in situations in which there has been no ulceration or breach of structure, and consequently where there could be no dead animal matter to dissolve.

It was noticed in this form by De Haen so far back as the middle of last century; and was pointed out by Mr. Hewson as frequently found, in dissections, on the surface of the pleura, the peritoneum, and the pericardium, in a perfectly genuine state. A very decided case, to which both Dr. Hunter and Mr. J. Hunter were witnesses, was published by Mr. Samuel Sharp about the same time that De Haen first brought the subject before the public. Nothing is more common or more copious than the secretion of pus without ulceration in the first stage of purulent ophthalmia, and in purulent inflammation of the mucous membrane of the urethra; and I remember having attended, about twelve years since, a gentleman in Bedford Row, who had irritated this passage by improperly introducing a bougie into the bladder, and about three days afterward discharged with his water not less than half a pint of pure pus, which separated itself from the water and subsided, and thus gave me an opportunity of examining it minutely. I requested Mr. Cline's attention to this case, and we saw not the slightest reason for suspecting any ulceration whatever.

Genuine pus is peculiarly distinguished by its consisting of white globules swimming in a fluid, which to the eye has the appearance of serum, but possesses characters of its own, equally different from those of serum and of every other secretion we are acquainted with; and which render it coagulable in a saturated solution of muriate of ammonia, which is its specific test. Pus, however, is not globular at its first formation, but a transparent fluid of a consistence in some sort resembling jelly: the globules are produced while it lies on the surface of the sore, usually, when not exposed to external air, in about fifteen minutes after its secernment. The perfection of pus seems to depend upon the large proportion which its globules bear to its other parts. It is specifically heavier than water, and approaches nearly to that of blood. [Professor Brande states its specific gravity to be about 1.030.] It has a sweetish, mawkish taste (apparently from its containing sugar), very different from that of most other secretions. After putrefaction it is acid. Dr. Bruggmans, who has analyzed it with much care, asserts that it contains an acid before putrefaction: but this has been denied by Sir Everard Home.—(*Dissertation on the Properties of Pus*, p. 20.) [And it is also mentioned by Professor Brande, that it does not affect vegetable colours till it has been for some time exposed to the air, when it becomes slightly sour; nor does it easily mix with water, alcohol, or dilute acids.—(*A Manual of Chymistry*, vol. iii., p. 190.)] For a further account of its chymical properties, the reader may consult Dr. Pearson's elaborate paper.*

In the process of the natural cure of an aposteme, we find that the stage of granulation, and consequently of incarnation, immediately succeeds that of ulceration, or the removal of the dead matter.* "The vessels," says Mr. Hunter, "forming themselves into a certain structure which fits them for secreting pus, it is so ordered that the same structure also fits them for producing granulations; and thus these two processes are concomitant effects of the same cause, which cause is a peculiar organization superadded to the vessels of the part.—(*On Inflammation; Of Pus*, p. 433.)

The idea of a change of organization is hypothetical, but ingenious, and perhaps correct. Change of action and change of effect we know; but at the rest we can at present only give a guess, and must leave it to future times to ascertain.

The obvious design of granulation, or incarnation, as it is often called, is that of repairing the loss the parts have sustained by the injury done: it is that of producing new flesh. Granulation, like vegetation, takes place from the centre below, in a direction upwards towards the skin; and hence exactly contrary to the course of ulceration, which always begins in the superior part of an abscess. The process commonly succeeds best upon exposure to the air, or at least after an opening externally; though there are instances of its having occurred where there has been no exposure whatever. The granulating pullulations, according to Mr. Hunter's explanation, consist of exudations of coagulating lymph from the vessels. He conceives it probable, not only that the old vessels extend into these pullulations and become elongated, but that new vessels also form in them, and, like the old, still continue to secrete pus. The granulations, as they become formed, mutually and readily unite; inosculation, or the attraction of cohesion, is established between them; and their vessels thus joined are transformed from secreting into circulating tubes. Immediately upon their formation, cicatrization seems to be in view. The parts which had receded, in consequence of a breach being made into them, begin now, from their natural elasticity, and, probably, from the contraction of the new created substance, to be brought nearer together; and the contraction of the sore proves a sign that cicatrization is speedily about to follow. This contraction takes place in every

* Phil. Trans., vol. for 1809, p. 313. See also a further description, under Marasmus Phthisis, in the sequel of the present volume.

point, but principally from edge to edge, which brings the circumference of the sore towards the centre; so that the exposed surface becomes smaller and smaller, even before there is any formation of a new skin.

There are two parts, at least, of this wonderful economy that still demand explanation. The first is, the real use of the pus after it is secreted; and the second, the means by which the absorbents carry off the dead matter. The same explanation may perhaps apply to both.

That pus is a peculiar secretion, distinguished by peculiar properties, and not a solution of the dead animal matter which it is the design of nature to remove, has already been sufficiently shown. "But I am apt to believe," says Mr. Hunter, "that we are not yet well, or perhaps not at all, acquainted with its use, for it is common to all sores; takes place in the most perfect degree in those sores which may be said to be the most healthy, and especially in those where the constitution is most healthy."—(*On Blood*, &c., part ii., ch. v., p. 436.) It forms, indeed, an exit to foreign bodies: is supposed by many to carry off humours from the constitution, or convert general into local complaints; and, by others, to act as a preventive of numerous diseases. Yet all these services, even admitting them to exist, are but secondary, and the final intention still remains to be accounted for.

In like manner, since the dead matter of an aposteme does not constitute the pus that is found in it, and hence can only be carried off by absorption, we have yet also to learn by what means it becomes prepared for an entrance into the delicate mouths of the absorbent vessels. There is no small difficulty in conceiving how these very minute mouths can apply themselves with sufficient activity to the various tough and hard substances they have to remove, as tendon and bone, when in close contact with them; but, as soon as the dead part becomes separated from the living, they are often no longer in close contact with them, except at the base, where there is little or no absorption at all; and, in many cases, as in biles, carbuncles, and other imperfectly suppurating tumours, possessing cores or tenacious sloughs, are at a considerable distance from them, with the entire body of the contained pus placed intermediately in the hollow.

In the last case, it seems impossible for them to act except through the medium of the pus; in reality, except through a solvent power possessed by the pus, and exercised upon the matter to be removed. And, if such be the nature of the action in this case, it is doubtless the nature of the action in all other cases: and hence we arrive at one immediate and direct use of pus, which is, that of becoming a solvent of the dead animal matter that requires to be carried off: not, indeed, by converting the whole substance at once into a solid mass, and still less into a fluid mass of its own nature, as supposed by Sir John Pringle, but only the surface of the substance to which it is applied; and which hereby is rendered fit for absorption, carried forward to the mouths of the imbibing vessels, and absorbed accordingly. And, as the same power is exerted in succession upon every fresh surface of the dead matter that becomes exposed to its action, the whole is at length carried away, and a cavity produced where before was solid substance.

That pus first kills and then dissolves the organized matter of an abscess was, as we have already seen, the opinion of Mr. Hewson. In the first part of this opinion he was completely mistaken; for, as we have already observed, the organized matter is dead before the process of suppuration even commences; in the second, he seems, to a certain extent, to have been correct, though he still erred in supposing the dead substance to be melted down into its own nature, and was unacquainted with the important process of its absorption. But, in advancing his own full and more elaborate hypothesis against the mistake of Mr. Hewson, Mr Hunter ran into the opposite extreme; and contended that pus is not designed to be a solvent at all, and that animal substances are decomposed in it with very great difficulty: thus leaving us totally at a loss to account for its use; and equally so to explain the manner in which the mouths of the absorbents of an abscess can operate upon, or even, in many instances, get at the material they are to remove.

Mr. Hunter, however, with the candour that so peculiarly belonged to him, made this question a subject of experiment, and the experiment, as he conceived, fully established his preconceived opinion; and gave proof that the pus of an abscess does not act as a solvent. This conclusion of his only shows how difficult it is for the most honourable mind, when biased by a favourite hypothesis, to weigh with an even hand the evidence that lies before it. "To see," says he, "how far the idea was just, that dead animal matter was dissolved by pus, I put it to the trial of experiment, because I could put a piece of dead animal matter, of a given weight, into an abscess, and which could, at stated times, be weighed. To make it still more satisfactory, a similar piece was put into water, kept to nearly the same heat. They both lost in weight; but *that in the abscess most*. And there was also a difference in the manner, for that in the water *became soonest putrid*."—(*On Blood*, &c., part ii., ch. v., p. 419.) There is nothing in animal chymistry, strictly so called, that decomposes animal substances so rapidly as putrefaction. And yet, in the present instance, the pus of an abscess evinced a more active decomposing power than the fluid of water, though aided by the accessories of putrefaction. It is not very wonderful that Mr. Hunter, though regarding this result as in his favour, should not be disposed to "rely on its accuracy," and he refers us, therefore, for a further proof, to a more competent experiment of Mr. (now Sir Everard) Home, which consisted in immersing a portion of muscle, weighing exactly one drachm, "in the matter of a compound fracture in the arm of a living man, and a similar portion into some of the same matter out of the body; also a third portion

into fluid calf's-foot jelly, in which the animal substance was pure, having neither wine nor vegetables mixed with it. These portions of muscle were taken out every twenty-four hours, washed in water, weighed, and returned again."

The result of this experiment is still more in favour of the solvent power of pus than the preceding. At the end of forty-eight hours, there was indeed no great difference, as the muscle in the abscess was reduced to thirty-eight grains, and that in the other two fluids to thirty-six. But from this period to ninety-six hours, the muscle in the jelly continued the same, while that in the abscess was reduced to twenty-five grains; and that in the exposed pus dissolved (*Dissertation on the Properties of Pus*, p. 32), the power of putrefaction, as Mr. Hunter observes, being, in this last case, superadded to that of the pus itself.

We hardly stand in need of other experiments. The solvent power of pus above that of water, of animal jelly, and hence, we may conclude, of animal fluids in general, is sufficiently established by the very evidence that is advanced in opposition to this power. And it should hence seem, that one at least of the direct uses of pus is to reduce, surface after surface, the dead animal matter which is exposed to its action to that state in which it may be rendered fit for absorption, and at the same time conveyed to the mouths of the absorbent vessels.

But I have for many years thought that it has also another equally important use; that, I mean, of assisting in the process of granulation; and a late article of Sir Everard Home, containing the observations of Mr. Bauer upon the germination of plants, and his application of those observations to the growth of the new vessels in animals (*Phil. Trans.*, 1818, pp. 180–194) seems, if not to have settled the question, at least to have very considerably favoured this view of it.

Having sown a quantity of wheat, for the purpose of noticing the changes which occurred from the first, Mr. Bauer took up every day several grains or plants for examination till they were ripe; and, in the course of his attention, was much struck with the rapid increase of the tubular hair of the root of a young plant of wheat in its earliest stage of vegetation; and, fixing his view entirely to that part of the plant, he observed small pustules, of a slimy substance, arising under the epidermis in the surface of the young root; and, in a few seconds, a small bubble of gas bursting from the root into the slimy matter, which it extended in a moment to the length the hair was to acquire; when the slimy matter surrounding the gas immediately coagulated and formed a canal. He repeated his observations on another plant, whose pubescence consisted of a jointed hair, and observed the same effect; a bubble issued from the young stalk, and extended the slimy mucus to a short distance, forming the first joint, which immediately coagulated and became transparent; and at its extremity a new pustule of the same slimy matter accumulated, into which, in a short time, the gas from the first joint rushed: and thus, in a moment, a second joint was formed. In the same manner, he observed the formation of the hairs of ten or twelve joints take place.

Impressed with the importance of these facts, Sir Everard Home immediately began to inquire how far the same course is pursued in the production of new animal matter. He first ascertained, by experiments of Mr. Brande, already noticed in the Proem to the second class of this work, that blood in a state of circulation contains a considerable proportion of air, which, in the process of its coagulation, escapes in the form of carbonic acid gas, and, in its escape, produces bubbles, as in the slime of plants; and that it escapes equally from the coagulating blood of veins and arteries, from effused serum, and from pus. And, in pursuing the subject, he found that on the coagulation of a drop of blood, placed in the field of a microscope, an intestine motion occurred, and a disengagement of a something took place in different parts of the coagulum; beginning to show itself where the greatest number of globules were collected, and from thence passing in every direction with considerable rapidity through the serum, but not at all interfering with the globules themselves, which had all discharged their colouring matter. Wherever this extricated colouring matter was carried, a network immediately formed, anastomosing with itself on every side through every part of the coagulum. When the parts became dry, the appearance of a network remained unaltered. In some instances, bubbles were seen to burst through the upper surface of the coagulum; this, however, did not prevent the ramifications that have been described from taking place. "When this happens," continues Sir Everard, "in living animal bodies, from whatever cause, and in whatever circumstances it takes place, no difficulty remains in accounting for its afterward becoming vascular, since all that is necessary for this purpose is the red blood being received into the channels of which this network is formed." He next proceeded to the subject immediately before us. "As the globules of pus," says he, "are similar to those of blood, I made experiments upon the fluid in which they are suspended, and found inspissation produce the same effect on it as coagulation does on the other; that a similar network is formed, and apparently by the same means; since, if pus be deprived of its carbonic acid gas (of which it contains a large quantity) by exhaustion in the air-pump, no such network takes place."

Additional experiments are still necessary upon this interesting subject; but, so far as they go, they seem very clearly to indicate the important and double use to which pus is subservient; that it acts as a solvent upon the dead matter, preparing it for absorption, and as a fomes for granulation and the production of new vessels.

Nor let it be observed, in opposition to this conclusion, that we are thus endowing it with incongruous and contrary qualities; and that,

if it be erosive in the one instance, it cannot be nutrient in the other; for the animal economy presents us with various examples of like effects, contrary, indeed, but not contradictory, produced by one and the same secretion on dead and on living matter, for which we need go no farther than to the very common operation of the gastric juice; which, while the most powerful solvent of dead animal matter in the whole range of animal chymistry, is a healthy stimulant to the living stomach, and even to other living organs; and has successfully been applied externally for this purpose by surgeons, to weak and ill-conditioned ulcers, and employed by physicians as an internal tonic in cases of dyspepsy and cardialgia.

SPECIES II.

APOSTEMA PSOATICUM.

PSOAS ABSCESS.

PAIN AND TENSION ABOUT THE LOINS, SHOOTING DOWN THE SPINE AND THIGHS; DIFFICULTY OF STANDING ERECT; FLUCTUATING ENLARGEMENT ALONG THE PSOAS MUSCLE; APEX OF THE TUMOUR IMMEDIATELY BELOW THE GROIN.

This is one of the most lamentable diseases we can ever be called upon to attend. It commences insidiously, and, at the same time, in parts so deeply seated as to render it very difficult to determine the place of its origin; and hence the psoas muscle itself, the cellular substance interposed between the peritoneum and the loins, the lymphatic glands, and the lumbar vertebræ, have been pitched upon by different writers. It is probable that most of these have formed the primary seat of affection in different cases, and that the inflammation has subsequently spread to one or more of the other parts: and hence, assuming no inconsiderable degree of latitude, M. Chaussier denominates the disease *Femoro-coxalgie*.

[The cellular substance behind the peritoneum, or about the psoas muscle, is now ascertained to be the most common seat of the abscess in its commencement. When the spine becomes carious in consequence of the pressure of an abscess, it has been correctly observed by Mr. Brodie, that the symptoms are different from those which attend a caries of the spine, commencing in the spine itself. For instance, the paralytic affection of the lower extremities is generally absent. Caries of the vertebræ and intervertebral cartilages, however, is sometimes the primary disease (*Brodie's Path. and Surg. Obs. on Dis. of the Joints*, pp. 301, 302, ed. 2), and the abscess the subsequent one. This case would be characterized by the peculiar paralysis of the legs, resulting from original caries of the vertebræ and disease of their ligaments and cartilages.] The pain attending the formation of lumbar abscess, is at first by no means violent, and the patient thinks lightly of it; it is sometimes felt in the back rather lower than the region of the kidneys; and generally extends down the thigh. [The testicle of the affected side is frequently retracted, and more or less uneasiness and pain are felt in the course of the spermatic cord. A very little exercise fatigues the patient, who mostly inclines the trunk forward, and in bed generally keeps the thigh of the affected side bent, a relaxed state of the psoas muscle being the most easy to him. The symptoms frequently continue stationary a long time. At length, a change occurs, indicated by rigours, loss of appetite, and followed by considerable acceleration of the pulse. Soon afterward the fluctuating tumour presents itself.] From the deceptive manner of its attack, medical treatment, which might have been of essential service at first, is fatally postponed; and the symptoms are regarded as those of an accidental strain. After the abscess is formed, however, the pain, in most cases, increases considerably, and, in common instances, the matter follows the course of the psoas muscle, and points externally a little lower than the inguinal glands; or it passes down the thigh, where, however, it is apt to dissever the muscles and form sinous abscesses. Sometimes, though rarely, the matter passes through the muscles of the back, and is discharged in the loins; and, in a few instances, it has been known to fall into the cavity of the back part of the pelvis. The abscess, on account of its great extent, is highly dangerous: an extent which it generally attains ere it points externally, or admits of being discharged. Hence, the patient very frequently sinks under a hectic fever, produced by the local irritation; while in most cases in which it has made a natural opening for itself, it has been found connected with so many deep sinuses, which cannot be followed up, that the same effect ensues.

[It is a curious fact in relation to this subject, that psoas abscess should rarely be met with in the United States of America. Professor Gibson saw only four cases of the disease during thirteen years, although professionally connected with extensive hospitals and alms-houses most of that time. Dr. Physic never met with a case of psoas abscess in America, unconnected with disease of the spine.—(*Gibson's Surgery*, vol. i., p. 214.) If these statements coincide with the experience of other practitioners in America, they are highly interesting, as affecting the question, whether, as is generally supposed in England, the psoas abscess is necessarily connected with a scrofulous constitution.*]

No mode of medical treatment has been found productive of any good purpose; and the case has been, in a very early stage of the suppuration, given over to the surgical practitioner. Yet even here different individuals have pursued different lines of conduct. [Kirkland believed that the patient had the best chance of recovery when the abscess was allowed to burst of itself, and *discharge itself very gradually by*

* The German medical authorities seem to support the above opinion, but in America the case is otherwise. Psoas abscess is not unfrequent in the United States; it sometimes exists where no spinal disease can be detected. This opinion is confirmed by the experience of Professor Stevens, Dr. McLean, Dr. J. K. Rodgers, Dr. Cheesman, and by other practitioners of ample experience.—D.

a small outlet. The latter precept has been found to be one of great importance.] Mr. Bell advises an early evacuation of the matter, lest the bones should become injured; while Mr. Abernethy apprehends less danger from its being suffered to remain, and at last evacuates it at different intervals, and by successive operations: by which means the cyst, in which the pus is principally lodged, may have an opportunity of contracting; and this, he thinks, it has a greater tendency to do than in abscesses where the inflammation is more violent. He is also attentive to close the opening the instant the matter is discharged, so as to prevent any increase of the inflammation by an access of air.

The real cause of danger does not seem to have been hitherto hit upon; but it may probably be referred to that tendency to a rapid spread of inflammation over their entire surface, which Mr. Hunter has shown to exist in all internal cavities, and the hazard of which is in proportion to the extent of the cavity; a subject already touched upon in the discussion of puerperal fever, and which we shall have other opportunities of illustrating as we proceed, particularly in some cases of varicose enlargement of the veins. Now, in the disease before us, we have not, it is true, any natural cavity, but we have an artificial cavity of long standing and large extent, in a highly irritable state, and which is therefore peculiarly predisposed to run into all the fatal effects of large natural cavities, when injured or otherwise rendered imperfect. The author throws out this hint, however, for future and general consideration.

[Mr. Crowther relates a few cases in which psoas abscesses were dispersed by the application of large blisters to the swelling, which were kept open with the savin cerate. The same practice, combined with the occasional employment of emetics, was also recommended by Mr. Abernethy.]

SPECIES III.

APOSTEMA HEPATICUM.

ABSCESS OF THE LIVER.

DIFFUSE PULSATING TUMOUR IN THE REGION OF THE LIVER; PRECEDED BY PAIN, A YELLOW COUNTENANCE, AND SHIVERING.

[THE ordinary symptoms, besides those spoken of in the definition, are, swelling and tension of the right hypochondrium, sometimes extending beyond it; pain in the right side, much aggravated by inspiration or pressure, and occasionally shooting up to the shoulder. In the case recorded by Dr. O'Brien, there was also great weakness of the right arm; a pale, anxious countenance, without yellowness; pulse 120, small and feeble; and no vomiting.—(*Trans. of Physicians in Ireland*, vol. i., p. 44.) Much doubt having been expressed by some physicians, whether true laudable pus could be formed in the substance of the liver, that distinguished pathologist, C. P. A. Louis, investigated the question, and, in the dissection of 430 subjects, met with five cases of hepatic abscesses, all of which presented genuine purulent matter.* It appears also from his dissections, that the abscesses are frequently encysted, and that the neighbouring portion of the liver is sometimes softer, but sometimes more indurated, than natural. In the cases of encysted abscesses, examined by himself, he could not decide positively whether they preceded, or were the consequence of, a dissolution of a greater or lesser number of tubercles; but he inclines to the latter opinion. In one very interesting case, reported by this author, the patient had voided large quantities of blood from the anus, and, after death, a clot of blood was found in a cyst in the liver; from which part, it is inferred, the blood had passed into the intestinal canal. As no communication could be traced, however, between the cavity and the biliary ducts, the conclusion appears questionable.—(*Louis*, op. cit., p. 385.) A common complication of abscesses of the liver seems to be a softening and ulceration of the mucous membrane of the bowels, especially that of the large intestines, the same affection of the lining of the small ones not being very frequent, except in phthisis pulmonalis, and fevers. The mucous coat of the stomach in some cases had red specks on it, was much softened, and, in certain places, incompletely ulcerated. Abscesses of the liver are mostly not single, but more or less numerous.† Their general fatality is partly ascribed by M. Louis to the liver not

* Louis, Mém et Recherches Anatomico-Pathologiques, p. 352, 8vo., Paris, 1826. The fluid discharged from an abscess connected with the liver, by Mr. Cæsar Hawkins, was not like common pus, but thick and adhesive, of a dark yellowish-green colour, and of a peculiar, though not offensive smell; and, upon being mixed with nitric acid, it appeared to contain biliary matter.—(See Med. Chir. Trans., vol. xviii., p. 100.) In another case the matter was thin, of a light brown colour, and could scarcely be called purulent.—(Op. cit., p. 106.) In these two instances the abscesses were only connected with the liver, and not in it. The punctures were followed by ulceration and sloughing of the skin, hemorrhage, and a destruction of nearly the whole thickness of the abdominal parietes. The disease had, in each patient, been preceded by symptoms of inflammation of the liver, and, after death, the cavity in which the matter had collected was so far obliterated, that it was difficult to decide positively where the fluid had been situated. The further particulars of these cases will be found interesting by the pathological inquirer.—ED.

† Dr. Stokes mentions, in his lectures (Am. Journ. of Med. Sc., No. xxx., p. 503), a curious fact, that it has often been found impossible to salivate persons labouring under hepatic abscess, so that the presence of matter in the liver, or its absence, may be determined by the circumstance of the patient being, or not being, susceptible to the full effect of mercury. This fact is confirmed by Dr. Marshall, a gentleman of great experience, and very conversant with the diseases of India, who states that he has never known a case in which abscess actually formed in the substance of the liver, in which salivation could be produced; and that when the patient became salivated he believed it to be a proof that there was no inflammation of an intense character, or that no abscess had formed.—D

having, perhaps, the power of repairing the mischief, as he never observed traces of cicatrization in it. Yet this inference seems to be contradicted by the cures which are upon record.—(*Louis*, op. cit., p. 385–394, 408.)]

This is also a very fatal disease, and usually terminates in one of the following ways:

Firstly, The substance of the liver is gradually and almost entirely absorbed from long-continued irritation; the melancholy accompaniments of which are, a tedious, icterical marasmus, hectic fever, great anxiety, and a sanious and fetid diarrhœa, which is the forerunner of death.

[In one example, recorded by Dr. O'Brien, the abscess extended over two thirds of the liver, the biliary ducts were nearly annihilated, and all but one sixth of the gall-bladder destroyed.* In another case, reported by Professor Gibson (*Surgery*, vol. i., p. 211), he says that, upon dissection, the fistulous orifice in the side was traced into the liver, or rather into its remains; for its substance had disappeared, and nothing of its structure could be found, except a shell, or cyst, somewhat larger than an egg, and filled with brownish matter.]

Secondly, The abscess breaks internally, and discharges itself into the belly; by which means the rest of the viscera are affected, and the termination is marasmus, ascites, and dissolution.† According to M. Louis, this mode of evacuation only takes place in chronic hepatitis.—(*Mém. et Recherches Anat. Path.*, p. 372.)

Thirdly, The pus sometimes finds a passage into the biliary ducts, and thence into the intestines; from these it is occasionally thrown into the stomach, and vomited in the form of a dark offensive material: but far more generally it is carried downward, and produces a violent looseness. Acids and ascescent medicines may here palliate for a time; but the issue is always fatal.

Fourthly, The enlarged liver becomes, in some cases, united by adhesive inflammation to the peritoneum, and the abscess opens externally; and, in this case, there is a chance of cure. The openings should be expedited by a caustic or the knife: and the cure will greatly depend upon the nature of the fluid which is discharged.

Fifthly, There is reason to believe that, in a few rare instances, the matter is carried off by absorption, when a healthy granulation takes place, and a cure is completed without any opening. This termination is more reasonably to be expected in a constitution otherwise sound, and where the liver has not been weakened or rendered torpid by any former affection. It is hence rather to be looked for in a temperate than in a tropical climate, and in youth than in advanced life.

[Sixthly, In certain cases, the matter of the abscess has made its way by ulceration through the diaphragm, and been either effused in the chest, or, opening a communication with the bronchiæ, been coughed up from the lungs. In hot climates, where acute and chronic hepatitis are very common complaints, abscesses of the liver are often noticed. In Great Britain they do occur, but not very frequently, except in those who have returned from a long residence in warm latitudes. The liver may suppurate, however, from other causes besides common hepatitis, as from blows or injuries of the head,* biliary concretions, phlebitis,† and the presence of worms in the biliary ducts.‡ In the Surgical Museum of the University of Pennsylvania is a preparation in which the substance and ducts of the liver are filled and perforated in every direction by numerous and very large lumbrici. The patient, a child, fell a victim to the irritation and suppuration.—(*Gibson*, vol. i., p. 209.)]

When the cure takes place without an opening, it is not always an easy matter to determine for a certainty that pus has actually been formed. But sometimes we can trace a fluctuation; and, at other times, the subsidence of the tension, pain, and pulse, after one or two severe shivering fits, may be regarded as sufficient indications. In a case of this kind that occurred to me in a young gentleman of about thirteen years of age, the shivering was so considerable as to make the teeth chatter; and within eight-and-forty hours, the pulse sunk from a hundred and forty to a hundred and twenty; and the abdominal tension and tenderness were considerably abated; as was also the distressing cough with which he had almost perpetually been harassed for some weeks. He was put upon a tonic plan of columbo and sulphuric acid immediately after this change, and recovered gradually.

[In India, the rapidity with which inflammation of the liver frequently proceeds to suppuration, has sometimes been so great as scarcely

* See Trans. of Physicians in Ireland, vol. i., p. 48. The editor opened the body of a woman about three years ago, where the same morbid changes were noticed. A very small portion of the fundus of the gall-bladder remained, and at least two thirds of the liver were occupied by abscesses. The preparation, which is now in his possession, will shortly be sent to the museum of the London University.—Ed.

† The ordinary effect of such passage of the matter into the cavity of the abdomen is a rapid and fatal degree of peritonitis.—Ed.

* Quesnay, in Mém. de l'Acad. de Chir., tom. i., p. 147. Bertrandi de Hepatis Abscessibus: Œuvres Chir. de Desault, tom. i. Also, a valuable paper by Mr. Rose on depositions of pus, &c. in the viscera, after injuries of different parts, in Med. and Chir. Trans., vol. xiv., p. 251, &c. The fact of abscesses of the liver arising from injuries of the head is doubted, however, by the very eminent pathologist, M. Louis. See his Recherches Anat. Pathol., p. 405. The editor suspects that the frequency of the occurrence from this particular cause has been exaggerated by writers.

† See Cruveilhier, Anat. Pathol. Andral refers to a case in which an abscess of the liver communicated with the interior of the vena cava; and to another in which the matter made its way into the pericardium.—Précis d'Anat. Pathol., tom ii., p. 598.—Ed.

‡ See Kirkland's Inquiry into the present State of Medical Surgery, vol. ii., p. 186. Also, Bond, in Med. Obs. and Inq., vol. i., p. 68.

to admit of time for the employment of antiphlogistic remedies. As Dr. O'Brien observes, this should never be neglected in chronic hepatitis, even where mercury may subsequently become necessary; and he commends general bleeding, and the use of cupping and leeches. In this country, surgeons rarely open abscesses of the liver in an early stage; but, in India, the contrary practice is said to prevail, and to be found the most advantageous.*]

SPECIES IV.

APOSTEMA EMPYEMA.

LODGMENT OF MATTER IN THE CHEST.

FIXED PAIN IN THE CHEST: BREATHING LABORIOUS, BUT EASIEST IN AN ERECT POSITION; DIFFICULT DECUMBITURE ON THE SOUND SIDE; FLUCTUATING ENLARGEMENT ON THE SIDE AFFECTED; DRY, TICKLING COUGH.

To the symptoms enumerated in the above definition, Hippocrates adds (Περὶ Παθῶν, pp. 476, 496) œdema of the feet, hollowness of the eyes, and a gurgling sound on shaking the shoulder. Of these additional signs, the first two belong rather to the hectic fever that generally accompanies empyema, than to the disease itself. The last has sometimes been met with in modern times.—(*Trécourt, Mémoires de Chirurgie*, &c.) Dr. Cullen regards empyema as a mere sequel of pneumonia, which, with him, includes inflammation of the pleura, as well as of the lungs; but as it may take place from inflammation of the mediastinum, pericardium, or diaphragm, to say nothing of that from external injuries, and as it is often doubtful what particular organ is directly injured, a separate species seems decidedly called for.

An empyema is sometimes produced by the bursting of a large vomica of one of the lungs into the cavity of the pleura: in which case, the cough becomes more frequent than before this result, and is either dry, or accompanied with a scanty, frothy, and noisy expectoration. The breathing becomes extremely difficult, with repeated fainting fits, and the dew of a cold sweat hanging over the throat and forehead; the cheeks and lips are of an ominous red, while the nails are livid, the pupils dilated, and the sight dim.

If percussion or the stethoscope be employed, before the vomica has broken, to the part in which the matter is seated, little or no sound will be returned, in consequence of the pressing fulness which exists there;† but if these methods be resorted to afterward, it will be found restored, in a considerable degree, to the part affected, from the hollowness which now exists there, while it will be comparatively found diminished in the posterior and inferior parts of the chest to which the discharged load is transferred. For the history and relative value of these diagnostics, the reader must turn to the treatment of PHTHISIS.—(Cl. III., Ord. IV., Gen III., Spe. 5.)

[Laennec does not seem to approve of the application of the term empyema to the bursting of a large vomica into the chest. "I apprehend" (Op. cit., p. 448), says he, "no one now considers empyema as the product of a vomica, which has burst into the cavity of the pleura. A softened tubercle may, indeed, discharge its contents in this manner, and may thus become the cause of a considerable effusion, by exciting a chronic pleurisy; but, in such a case, the tuberculous matter must only be considered in the light of an extraneous body, determining inflammation, and consequent effusion, by its mechanical or chymical qualities. It is also to this species of pleurisy that we must refer those histories of lungs entirely destroyed by suppuration, which we find recorded in the older writers." In this country, however, whatever may be the principal source of this purulent fluid in the cavity of the pleura, the term empyema is employed. In acute pleurisy, besides an effusion of coagulating lymph, a serous fluid is poured out, which is of a light yellow colour and transparent, or with its transparency only slightly lessened by the intermixture of small fragments of concrete pus or lymph. In the latter case, it resembles unstrained whey. The fluid is generally devoid of smell. Many physicians suppose, that, in acute pleurisy, no effusion takes place till after some days; but Laennec declares (Op. cit., p. 423–5), that he has several times observed all the physical signs of effusion; that is, ægophonism,* and absence of the respiration and sound on percussion, in one hour from the commencement of the disease; and he has seen the side obviously dilated at the end of three hours. On the other hand, he does not remember to have met with a single case, in which the effusion was doubtful under the stethoscope during the first and second day. The utmost that he admits on this point is, that the effusion continues to increase for several days, and that it is only at the end of this time that it becomes too manifest to be overlooked, from the dilatation of the affected side, and the total absence of sound on percussion. He is convinced that the effusion of serum is contemporaneous with inflammation in all serous membranes. The fluid effused is generally absorbed after the inflammation has subsided; and it is only when it remains in such quantities as to occasion very urgent symptoms, that any opera-

* Prof. Horner thinks that hepatic abscess may be managed by opening it even when adhesion to the side has not occurred, provided the liver be attached to the side by one or two stitches, which prevents the effusion of pus into the abdomen.—See Am. Journ. of Med. Sc., No. XXVII., p. 90.—D.

† Dulness of sound on percussion, and absence of the respiratory murmur on the diseased side, which remains perfectly motionless. Puerile respiration in the opposite lung, accompanied with increased action of the respiratory muscles, and frequently a displacement of the heart, descent of the diaphragm, and protrusion of the abdomen.—ED.

* A tone or echo of the voice, distinguished with the stethoscope; and so named by Laennec, from its having a trembling or bleating sound, like the voice of a goat.

tion should ever be contemplated for its discharge.

The disease which Laennec represents as producing the most common species of purulent empyema, is chronic pleurisy, of which he describes three kinds: 1st, that which is chronic from its origin; 2dly, acute pleurisy, become chronic; 3dly, pleurisy complicated with certain organic productions on the surface of the pleura, bearing a gross resemblance to cutaneous eruptions.

According to Laennec, chronic pleurisy does not differ essentially in its anatomical characters from the acute: the pleura, however, is generally of a deeper red, and the serous effusion is more abundant, and almost always less limpid, being mixed with small albuminous flocculi. In chronic pleurisy, the extravasated fluids have a more fetid smell than in the acute, and often yield a strong alliaceous odour, analogous to that of gangrene.* The effusion is rendered daily more considerable. The affected side becomes manifestly larger; the intercostal spaces grow broader, and rise to a level with the ribs, and sometimes even higher. The lung, compressed towards the mediastinum and spine, and retained in this position by pseudo-membraneous exudation, is sometimes so reduced in size as not to be more than four or six lines thick, even in its middle. In this state, the pulmonary tissue is soft, pliant, and dense, without any crepitation, more pale than natural, and almost without blood; yet the alveolar texture very distinct.†]

Modern researches prove, that collections of pus in the chest frequently occur without any appearance of ulceration. To such cases Mr. Hewson has several references. "The cavities of the pleura, pericardium, &c.," says he, "are sometimes observed to contain considerable quantities of pus without the least marks of ulceration. In one patient I found three pints of pure pus in the pericardium, without any ulcer either on that membrane or on the heart. In another, the cavity of the pleura of the right side was distended with a pus that smelt more like whey than a putrid fluid, and the lungs were compressed into a very small compass: but there was no appearance of ulcer or erosion, either on these organs or on the pleura; but only under the pus was a thin crust of coagulable lymph." We have already made some observations upon this secretion of imperfect pus, and it is not necessary here to dwell upon it.

Numerous cases are recorded, in which the contained fluid has disappeared.* It has passed off by the intestinal canal (*Kelner, Diss. de Empyemate*, Helm., 1670; *Marchetti*, Obs. 82, 89), by the bladder,* and by the vagina (*Schlichting, Phil. Trans.*, vol. xlii., p. 70), in the form of pus. It has also been frequently carried off by an opening formed by nature, and the patient has recovered his usual health. This opening has commonly been between the ribs; most usually between the third and fourth, but in one instance we find the abscess pointing and bursting under the scapula.—(*Hurten, Diss. de Empyemate*, Argent., 1679.) [The escape of the effused fluid through the intercostal muscles, from gangrene of a portion of the pleura, is regarded by Laennec as very rare. He says that he has only seen one case of it himself, and that M. Recamier has not seen more than two; and with respect to another mode in which the fluid finds vent, namely, in consequence of the formation of an abscess in the intercostal spaces, and its rupture both externally and internally, Laennec has only met with a single case of this kind. Andral reports three others. There can be no doubt, from the numerous examples on record, that these events are much more common than Laennec imagined. Dr. Forbes expresses his belief, that in cases of chronic pleurisy, the escape of the matter through the walls of the chest is by no means very uncommon. He has himself met with more than one instance of it. Laennec states (Op. cit., p. 435), that a cure has, perhaps, more frequently followed the evacuation arising from these kinds of abscesses, than from an operation. The cure, however, is not always complete; as a fistula is apt to remain, frequently kept up by a caries of the ribs.

Morgagni has recorded (*De Sed. et Caus. Morb.*, ep. xxii., art. 13) a singular case of a double empyema; a lodgment of pus being formed on both sides: and Balme a still more ex-

* The fluid effused in acute pleurisy is of a pale yellow or straw colour, and generally a little turbid, from an admixture of coagulable lymph. In chronic pleurisy, the fluid is not only in larger quantities, but of a consistence approaching to that of common pus, and generally mixed with flakes of coagulable lymph. However, as Dr. Townsend has observed, it is not always easy in practice to determine *à priori* the precise nature of the fluid collected within the chest, as its physical characters are found to vary considerably, even in those cases that most closely resemble each other, in their origin, progress, and symptoms.—Cycl. of Pract. Med., art. Empyema.—Ed.

† As in empyema the matter is usually contained in only one side of the chest, its pressure sometimes displaces the heart. The editor has seen several examples, in which a considerable quantity of fluid in the left sac of the pleura has caused such a change in the position of the heart, that its pulsation could only be felt on the right side of the sternum. The pus, however, may be circumscribed by the adhesive inflammation, and then this effect will not be produced. In the case lately published by Mr. Woolley, the heart pulsated on the right side, in a situation precisely corresponding to what it ought to have occupied on the left. This was in a child between five and six years of age, that was cured by paracentesis alone.—(Med. Gaz. for Nov., 1833, p. 318.) Such displacement is one of the least fallible symptoms *of a collection of* fluid in the chest.—Ed.

* In the Medical Recorder for 1825, p. 553, Dr. Reese has stated a case of empyema, in which large quantities of pus passed off from the stomach and bowels. The patient died; and on dissection an opening was found in the œsophagus, about an inch and a half from the cardiac orifice of the stomach, through which the pus had passed.—D.

† Büchner, Diss. sistens solutionem Empyematis per mictionem purulentam.—Hal., 1762, N. Act Nat. Cur., vol. i., obs. 5.

traordinary case, in which the pus entered the cellular membrane, and spread over almost the whole trunk.—(*Jour. de Méd.*, tom. lxvi., p. 244.)

Dr. G. Hawthorn has given an instance of this disease, that for its severity and danger, and particularly for its successful issue, is well worth recording.—(*Edinb. Med. and Surg. Journ.*, No. lxi., p. 513.) The patient was thirty years of age, and the disease had been brought on by exposure to damp night air in a state of intoxication. He suffered greatly from quickness of pulse, incessant cough, oppression, and dread of suffocation. A distinct fluctuation was perceived in about three weeks from the attack; shortly after which he was a little relieved by a discharge of purulent matter effused into the bronchial cells, and expectorated to the extraordinary amount of five or six pounds daily, for many days in succession, a fluid of an intolerably offensive smell and putrid appearance. He continued, however, to grow worse and weaker; his feet and legs swelled; his countenance was ghastly, and he had colliquative sweats. About twelve weeks from the attack, the operation was performed; nearly 20 lb. of pus was discharged on the first day and night; and he gradually recovered.*

[The evacuation of the matter by the bronchiæ is stated by Laennec (Op. cit., p. 436) to be more common than that through the intercostal muscles. The fact, he believes, was first clearly established by Bayle. It scarcely ever occurs but in chronic pleurisy; though Andral relates one example of it in the acute disease.—(*Clin. Médicale*, tom. ii., obs. 36.)

The symptoms indicating the propriety of an operation are, the dilatation of the affected side; œdema of the same side and arm; depression of the liver, and displacement of the heart towards the side free from fluid. Laennec has shown, however, that all these symptoms may be absent; and it even frequently happens that at the very time when an operation is proper, the affected side, although full of pus, is smaller than the opposite one, in consequence of the absorption which has already taken place. But in all such cases, the results of percussion and auscultation leave no doubts respecting the effusion.—(Op. cit., p. 475.) Laennec points out two cases of pleurisy, requiring that an operation should be performed for the discharge of the fluid from the chest. The first is when, in an acute pleurisy, the effusion is very copious from the beginning, and increases so rapidly as to give rise, after a few days, to general or local anasarca, and to threaten suffocation. The second is a chronic case, either in consequence of a pleurisy originally chronic, or of the acute disease changed into this state. In such circumstances, when œdema of the affected side has come on, when the long continuance of the disease, the progressive emaciation and debility of the patient, and the failure of every measure employed to produce absorption, leave nothing to be expected from other means, the operation is warrantable.]

When the fluid is discharged by paracentesis, Hippocrates repeatedly urges the surgeon to evacuate it only by degrees (Περὶ Νουξῶν, ii., p. 476, l. 42; Περὶ τῶν ἐθνος Παθῶν, p. 536, l. 15). and Borelli (Cent. i., obs. 72) gives a case in which the patient seems to have sunk under a sudden evacuation. There has also been no small discussion concerning the part of the thorax to which the scalpel may be most advantageously applied. David advises near the sternum (*Mem. pour le Prix de l'Acad.*, x.); Mr. Sharp between the sixth and seventh ribs (*Crit. Inquiry*, &c., chap. vi.); Mr. Bell wherever the pain or fluctuation may direct.—(*Surgery*, vol. ii., p. 390.)

Mr. Warner, whose success made it many years ago a favourite operation in our country, seems to have been of Mr. Bell's opinion, and varied the point of opening according to the nature of the case. And so little danger did he apprehend from the use of the scalpel on any occasion, that he not only evacuated in all instances the whole of the matter at once, but in one or two examples, operated where there was neither a polarized pain, nor fluctuation, nor visible discoloration, nor any external sign whatever to direct him to one part rather than to another, or even to determine the real nature of the disease, otherwise than from the specific symptoms laid down in the preceding definition.—(*Original Cases and Dissections*, &c., by John Forbes, M. D., p. 257, 8vo., Lond., 1824.)

In Mr. Warner's cases, about twenty ounces of pus formed the average of discharge at the time of the perforation (*Phil. Trans.*, vols. xlvii., xlviii., li., as also his works in their collected form): the patients usually found instant relief; the pain, cough, and quickness of pulse diminishing, and the breathing becoming easier. He dressed the wound with a sponge tent till there was no longer any discharge, and afterward superficially; and, in about six weeks, the patients were cured. In this case, it is perhaps more necessary to keep the wound open than in any other operation; for otherwise the secreted pus is apt to accumulate, and the operation must be renewed.*

[The following remarks by Professor Laennec are interesting:—The place of election, he says, commonly adopted by surgeons for this operation, is the most depending point in the anterior and lateral parts of the chest: a rule that cannot be good always, because the most dependant point varies with the position of the patient. The natural posture of a patient affected with empyema is to lie on the diseased side; and, in this case, the most depending point is the space

* A patient under Dr. Croker, of Dublin, was tapped for an empyema, and fourteen pints of pus were discharged from the left cavity of the pleura. In Dr. Archer's case of successful paracentesis of the thorax (Trans. of Dubl. Assoc., vol. ii.), eleven pints of inodorous fluid were drawn off, and in a few weeks the patient was convalescent. The interior of the pleura in such cases is almost always lined by a pseudo-membrane, such as constitutes the cyst of an abscess.—ED.

* Another case of two successful operations on the same person is related in Horn's Archives for March, 1826; an interval of twenty-two years elapsed between the operations.—D.

between the fifth and sixth ribs. Many other reasons, Laennec observes, point out this spot as the best. For instance, we know that the upper lobe adheres to the ribs more frequently than any other part of the lungs, and that the lower lobe is frequently attached to the diaphragm. On the right side, we know that an enlarged liver frequently reaches as high as the sixth, or even the fifth rib; and that on both sides the thickest false membranes, and consequently adhesions, exist at the junction of the diaphragm with the walls of the chest. Finally, we know that the greatest portion of the effused fluid is collected about the middle of the side. The best point is a little anterior to the digitations of the serratus major. Should there chance to be any old adhesions in this point, we shall readily discover them by means of some remains of respiration over their place.* But if, on percussion, the sound be dead at this spot, and the sound of respiration be wanting, we may safely make an incision.] Riedlin operated with success twice on the same person.—(*Lin. Med.*, ann. v., obs. 30.)

The matter, when discharged or examined on dissection, has been found of very different consistences: sometimes like what Laennec has described; sometimes pure pus; sometimes cheesy; and sometimes gelatinous. And the mischief to the interior of the chest has, in some cases, been very great. Several of the ribs have been found carious (*Heurmann, Vernischte Bemerkungen*, vol. ii., p. 217); the lung on the affected side totally eroded (*Kelner, Diss. de Empyemate*, Helmst., 1670); and, in one case, the pericardium destroyed as well as the lung.—(*Goekel, Gallicinium Medico-pract.*) The morbid changes described by Laennec have already been noticed.

[Owing to various causes, the operation is generally unsuccessful. 1. The first of these, as specified by Professor Laennec, is the bad condition of the lung itself, which is frequently tuberculous. 2. The irritation of the pleura, by the entrance of air into the chest, has been considered the chief cause of the great and offensive discharge, which too often ensues and destroys the patient. The admission of air into the chest, Laennec admits, must affect the action of the organs contained in it; but its immediate impression, he says, is not on the pleura, which, in acute pleurisy, is covered with lymph, and in chronic with thick pultaceous matter. 3. The greatest impediment to the success of the operation is, in Laennec's opinion, the compression of the lungs against the spine and mediastinum, and the nature of the investing false membrane. The lung, from the long compression, has lost its elasticity and expansibility, the inspired air penetrates it with difficulty, and the original dimensions of the organ are very slowly recovered. Indeed, it never returns to its natural size. Hence, with a view of favouring the expansion of the lung, Laennec had it in contemplation to revive the plan of exhausting the air from the chest with cupping-glasses: a plan best accomplished with a syringe, as advised by Mr. Jowett, and formerly recommended by Scultetus and Anel.—(Op. cit., p. 476–479.)

* Under such circumstances, the place for the incision should be varied. In one case of this description, Laennec, after making an incision through the integuments, over the space between the fifth and sixth ribs, introduced a trocar; but no fluid came out. The patient died; and in the *post-mortem* examination it was found that the instrument had entered the cavity of the abdomen, after transfixing the diaphragm, which had been pushed upward by an enlarged liver, and had become firmly adherent to the seventh rib. A similar accident occurred in Lamotte's practice.—Ed.

SPECIES V.
APOSTEMA VOMICA.
VOMICA.

DERANGED FUNCTION OF A THORACIC OR ABDOMINAL ORGAN; SUCCEEDED BY A COPIOUS DISCHARGE OF PUS INTO SOME PART OF THE ALIMENTARY CHANNEL; AND ITS EVACUATION BY THE MOUTH OR ANUS.

The specific term is a derivative from the Latin *vomo*, "to eject," especially from the stomach, but not exclusively so; and hence, on the present occasion, it is used in the comprehensive sense in which it is employed by Celsus, who applies it to a bursting of pus from the liver, or any other large internal organ, as well as the lungs.—(*De Medecin*, lib. iv., cap. viii.) Sauvages follows Celsus in this interpretation, but distinguishes the vomica from the aposteme, by making the discharge from the latter consist of pure pus, and that from the former of a mixed matter, being at first a sort of adipose mucus (mucus quidam adiposus), which at length becomes purulent. Avenbrugger, to whom we are indebted for the *Inventum novum*, or method of ascertaining diseases of the chest by percussion, takes nearly the same range, or rather carries it to a still wider extent, so as to include other depositions than that of genuine pus, and hence divides vomicæ into purulent and ichorous, meaning by the latter term the reddish yellow fluid occasionally found in a sac from the destruction of a hepatized or scirrhous lung, or other organ.* Boerhaave and Cullen confine vomica to the lungs, and this in a more restrained sense than most writers; for they limit it to what has been called, though with no great accuracy, *occult vomicæ*, "vomicæ clausæ." Linnæus and Vogel, on the contrary, while they confine the term to the lungs, explain it by *open vomicæ*, "vomicæ apertæ," in which the pus is thrown forth profusely and suddenly. One termination of the hepatic aposteme may be regarded as a variety of this species; for, as we have observed, it sometimes issues in a discharge of pus by the mouth or rectum. [Dr. Good supposed that pulmonary vomicæ consisted in conglobate glands, first enlarged by a strumous congestion, and afterward slowly and imperfectly suppurating. Others have described them as abscesses, the

* Inventum Novum ex percussione thoracis humani, ut signo, abstrusos interni pectoris morbos detegendi. Vien., 8vo., 1761.

result of inflammation. On the contrary, Professor Laennec (Op. cit., p. 354) sets down an abscess in the lungs from inflammation as an extremely rare case, as at least a hundred times as rare as a true vomica. He represents vomicæ as the result of the softening of a tuberculous mass of large size, and that the copious expectoration, usually taking place after their rupture, is the secretion from the sides of the large tuberculous excavation.] Vomicæ are not, however, always so large as described by this author; they vary in size from the diameter of a millet-seed to that of an orange. The smallest rarely contain any fluid, and sometimes not even a cavity (in which state, indeed, the editor conceives they are only tubercles); but they are often highly irritable, and maintain a very considerable degree of hectic fever. When ulceration has taken place, and pus is secreted, the irritability frequently subsides; the pulse improves, the febrile exacerbations are less frequent and violent, and the patient flatters himself he is recovering. The vomica at length bursts and disabuses him; he sinks gradually from the quantity of the daily discharge, and the confirmed hectic; or if the disease be seated in the lungs, and the cavity extensive, he may be suffocated by the volume of pus that overwhelms the trachea.

Bartholine gives a singular case of an occult vomica of the lungs, that, accompanied with an asthma, produced great emaciation; but was fortunately cured by the wound of a sword, the point of which passed between the ribs and opened the sac. A considerable flow of pus followed, and the patient recovered gradually from the time of the accident.—(*Hist. Anat.*, xiv., cent. 6.)

The methods of percussion and mediate auscultation are now very generally resorted to on the continent and in our own country, to ascertain the existence and extent of this affection when seated in the chest; the theory and employment of which the reader will find explained at some length, under the treatment of PHTHISIS.—(Cl. III., Ord. IV., Gen. III., Spe. 5.)

GENUS II.

PHLEGMONE.

PHLEGMON.

SUPPURATIVE, CUTANEOUS TUMOUR; TENSIVE; GLABROUS; PAINFUL; AT LENGTH FLUCTUATING, AND BURSTING SPONTANEOUSLY; THE PUS UNIFORM AND GENUINE.

UNDER the last genus, we took a general survey of the process and economy of suppuration, and noticed many of the most extensive and dangerous forms in which suppuration ever presents itself. We are now advancing to inflammatory affections, consisting of tumours of small extent, and either entirely confined to the integuments, or dipping but a little way below them.

The term phlegmon, from φλέγω, "inflammo," was used among the Greeks for inflammation generally. It has long since, however, been employed in a far more limited sense by medical writers of perhaps every school; though few of them have given a very clear definition of the exact sense in which they have intended to use it; or perhaps have formed such a sense in their own minds. Thus Dr. Cullen makes it comprise a multitude of tumours or tubercles of different degrees of inflammation, some suppurative, some unsuppurative, some serous, some callous, some fleshy, some bony; as bile, minute pimple, sty, stonepock, abscess of the breast, and spina ventosa, or carious bone; with many others altogether as discrepant; while by Sauvages it is limited, and far more correctly, to spheroidal tumours, possessing redness, heat, tension, violent throbbing pain, spontaneously suppurating. Not, indeed, essentially different from the character now offered, and involving most of its species. Vogel, however, makes it a part of its generic character, that the inflammatory tumour, in order to be a phlegmon, must be at least as large as a hen's egg; while Dr. Turton, in his useful glossary, not knowing how to reconcile the clashing descriptions which are thus given of it, merely explains it, after the Greek manner, "an inflammation," leaving the reader to determine the nature of the inflammation according to his own taste.

It is necessary, therefore, to come to something more definite; and I believe that the character now offered embraces the common idea of phlegmon; or, if not, will propose what should seem to form a boundary for it. And, thus explained, it will comprise the following species:—

1. Phlegmone Communis. Push.
2. ——— Parulis. Gum-bile.
3. ——— Auris. Imposthume in the ear.
4. ——— Parotidea. Parotid Phlegmon.
5. ——— Mammæ. Abscess of the breast.
6. ——— Bubo. Bubo.
7. ——— Phimotica. Phimotic Phlegmon.

[By other writers, phlegmon is described as inflammation of the cellular membrane of any part of the body; but, as this tissue is also affected in erysipelas, the definition fails. The editor, in his surgical writings, always understands by phlegmonous inflammation, the healthy, simple form of this affection, particularly when situated near the surface of the body. But there is every reason to presume, that an inflammation of a similar character often affects many of the deeply seated parts. Such an opinion, he believes, will be found to agree with the doctrines inculcated, and the facts pointed out, by Mr. Hunter.]

SPECIES I.

PHLEGMONE COMMUNIS.

PUSH. COMMON PHLEGMON.

TUMOUR COMMON TO THE SURFACE; BRIGHT RED; HARD; DEFINED; HEMISPHERICAL; POLARIZED; GRADUALLY SOFTENING AND BURSTING AT THE POLE.

IN vernacular language, this species is denominated a *push*; and, in size, has a near approach to a bile, or furuncle; but essentially differs from it in having its pus uniform and mature, while that of the bile is always intermixed with a core. It is commonly a mark of high

entonic health, or a phlogotic diathesis; and rarely requires any other medical treatment than bleeding, or a few cooling purgatives.

Where, however, pushes appear in crops, and especially in successive crops, they support a remark we had occasion to make in opening the present order, that, in conjunction with the phlogotic diathesis, there is probably a peculiar susceptibility of irritation; since we frequently find persons of the highest health, with firm and rigid fibres, pass great part, or even the whole of their lives, without any such affection as the present. Such susceptibility is far more common, indeed, to a habit of an opposite character; but it seems from this, as well as from other circumstances, not unfrequently to inhere in the temperament we are now contemplating.

SPECIES II.
PHLEGMONE PARULIS.
GUM-BILE.

TUMOUR SEATED ON THE GUMS; DEEP RED; HARDISH; UNDEFINED; PAIN OBTUSE.

This is sometimes limited to the substance of the gums, and sometimes connected with a caries of a tooth or socket. In the first variety, it is only a disease of a few days duration, and ceases almost as soon as it has burst or is opened; in the second, it will often continuet roublesome till the carious tooth is extracted, or the diseased socket has exfoliated, or the whole of its texture is absorbed; in which case the tooth will become loose, and may at length drop out spontaneously.

Gum-biles, and especially when connected with a morbid condition of the subjacent teeth, or their alveoli, rarely disperse without passing into the suppurative stage: and hence, the means of prohibiting this termination are usually tried in vain, much time is lost, and protracted pain encountered. For these reasons it is better to encourage than to repel the suppurative process, by warm cataplasms or fomentations; and to open the tumour as soon as it begins to point. An early opening is of importance; for, from the toughness and thickness of the walls of the abscess, it is seldom that the confined pus obtains a natural exit with sufficient freedom; while, in some instances, the ulceration assumes a sinuous character, or works into the substance of the cheeks, and at length opens on their external surface. The worst and most painful gum-biles are those which form on the dentes sapientiæ; the swelling, from the violence of the irritation, spreads rapidly and widely; so that the entire cheek is sometimes involved in it, the neck indurated, and the eye closed.

SPECIES III.
PHLEGMONE PAROTIDEA.
PAROTID PHLEGMON.

TUMOUR SEATED UNDER THE EAR; REDDISH; HARD; PAIN OBTUSE; SUPPURATION SLOW AND DIFFICULT.

It is not a little singular that Dr. Cullen, who extends the genus of phlegmone wide enough to embrace not only inflammation of the ear and of the breast, gum-bile, and phimosis, but also furunculus, varus, gutta rosea, sty, and, as already observed, several affections of the bones, should have banished suppurative inflammation of the parotid and inguinal glands, not only to another genus, but to a very remote part of his system; where they occur in the class and order of *local tumours*, in company with warts, corns, and sarcomata, which have naturally no inflammatory character. Here, too, they are conjointly described under the generic name of bubo, with the generic character of "glandulæ conglobatæ tumor suppurans;" a definition which does not apply to the parotid gland, whose structure is not conglobate, but conglomerate. The present, therefore, is the proper genus for including suppurative inflammation of the parotid and inguinal, as well as of the mammary glands.

Phlegmonous inflammation of the parotid gland offers us the two following varieties:—

α Simplex. Simple parotid phlegmon.	Incarning and cicatrizing easily.
β Maligna. Malignant parotid phlegmon.	Accompanied with a foul slough, and incarning with difficulty.

In the SIMPLE OR BENIGN VARIETY, though the suppurative process is slow and inactive, the incarnation subsequent upon the breaking of the abscess is regular and unobstructed. I was requested not long ago to see a young lady of fifteen years of age, who had been troubled with this species of phlegmon for more than three months: there had been, for about a fortnight, an evident pointing towards the surface, and a feel of irregular fluctuation: it afterward broke; a large quantity of good pus drained away daily; and the tumour, which at first was extensive and hard, by degrees very considerably diminished, and clustered or divided into lobes, and at length disappeared altogether. Her general habit was relaxed, but did not seem to be strumous. She had menstruated earlier than usual, and was of a disposition peculiarly sprightly and cheerful. The local treatment at the commencement was leeches, frequently applied, and alternated with mercurial plaster. But no benefit proceeding from the discutient plan, lotions of water and liquor ammoniæ acetatis, in equal parts, were afterward employed to aid the suppurative process.

The abscess, in some cases of this variety, is of considerable magnitude, and consequently the discharge of pus very large. And we have some instances on record in which the pus has been absorbed, and carried off by metastasis to some remote organ. Dr. Saunders gives a case in which it passed away by the rectum (*Observations on the Red Peruvian Bark*); Alix, by a fontanel at the navel (*Obs. Chirurg.*, Fascic. i.); and the Transactions of Natural Curiosities, by the bladder.—(Vol. i., obs. 39.) It has sometimes been confounded with parotitis or mumps;

and has hence been said to sympathize with one or both testicles in males, and to be contagious. Cavallini has made this mistake in his collection of surgical cases (*Collezione di Casi Chirurgici*, vol. i., p. 447); and we find a like error in the Memoirs of Toulouse.—(*Histoire et Mémoires de l'Académie de Toulouse*, tom. i., 1782.)

The SECOND VARIETY of parotid phlegmon is of a malignant character. It seldom appears in early life, and in females sometimes follows the cessation of the catamenia. It is still slower in its progress than the preceding; and when at length it breaks, the pus is imperfect and cheesy, or serous. It is also profuse, and protracted to a long period, and accompanied with foul sloughs. The patient is debilitated by the discharge, the irritation excites hectic fever, and the case frequently terminates fatally. Bark, hyoscyamus, conium, and similar tonics and narcotics, have been tried; but for the most part with little success.

It assumes, occasionally, a scirrhous hardness, and grows to a considerable extent. It has been extirpated, but with variable success, when upwards of three pounds in weight (*Kaltschmied, Pr. de Tumore scirrhoso trium cum quadrante librarum glandulæ Parotidis extirpato*, Jen., 1752); sometimes with a cure (*Siebold, Parotidis scirrhosæ feliciter extirpatæ Historia*, Erf., 1791); but, at other times, it has degenerated into a foul, bleeding, extensive, and fatal ulcer.—(*Commerc. Lit. Nor.*, 1733–8.)

SPECIES IV.

PHLEGMONE MAMMÆ.

ABSCESS OF THE BREAST.

TUMOUR SEATED IN THE BREAST; PALE-RED; HARDISH; IN IRREGULAR CLUSTERS; WITH A PRICKING AND ACUTE PAIN; SUPPURATION QUICK AND COPIOUS.

THIS is sometimes produced by some accident, as that of a blow or severe pressure; but more generally proceeds from a redundance and consequently undue stimulus of milk, when first secreted after childbirth, so that the lacteal tubes have not time to enlarge sufficiently for its reception: in which last instance it is usually called MILK ABSCESS. [Professor Gibson conceives, that one of the most common causes of the mammary abscess is the custom prevalent among nurses, of feeding women, after delivery, upon nutritious, high-seasoned, and stimulating articles, instead of letting them observe a proper regimen, calculated to obviate inflammation.*]

"In either case the suppuration commonly begins in many distinct portions of the inflamed part; so that it is not one large circumscribed abscess, but many separate sinuses, all of which generally communicate. Now it usually happens that only one of these points externally, which being either opened, or allowed to break, the whole of the matter is to be discharged this way. But we sometimes find that the matter does not obtain a ready outlet by this opening, and then one or more of these different sinuses make distinct openings for themselves."—(*Hunter on Blood*, p. 469.)

In this case the complaint is usually protracted and tedious, though, where the constitution is good, the issue is always favourable.

[Mr. Hey has described one variety of mammary abscess, which proceeds more slowly to suppuration than ordinary cases. The matter is often discharged by several openings, which become fistulous and lead to narrow sinuses, that wind in every direction in the breast. When these sinuses are laid open, they appear nearly filled with a soft purple fungus.—(See *Hey's Pract. Obs. in Surg.*, 3d edit., p. 522.) Unless properly treated, it is a case that has little chance of cure.

In the early stage of phlegmonous inflammation of the breast, resolution should be attempted by means of leeches, gentle suction of the breast with the mouth or nipple-glass, purgatives, and low diet.* But if suppuration occur, the progress of the matter to the surface should be expedited by fomentations and warm poultices.† When the matter is deeply seated, and approaches the surface very slowly, and the patient is much reduced by severe pain and sleepless nights, an opening becomes necessary.‡ The poultice must be continued until the discharge nearly ceases, and then superficial dressings will complete the cure.§ If sinuses remain, the pressure

* See Gibson's Institutes of Surgery, vol. i., p. 205, Philadelphia, 1824. Also Sir Astley Cooper's Illustrations of the Diseases of the Breast, p. 9. "Its principal cause," he says, "is the rush of blood which takes place each time the child is applied to the bosom, and which by nurses is called the *draught*, and is the preparatory step to the secretion of milk. Such occasional, irregular, violent, and frequent determinations of blood, produce inflammation; and the necessary frequent exposure of the bosom in suckling, as well as the active exertions of the child in sucking, add to the occasional irregularities of the circulation. The nurse also often produces these abscesses immediately after lying-in, by refusing to put the child early to the breast, and stimulating the mother with strong drinks."—ED.

* Evaporating lotions, and purging with sulphate of magnesia, or castor-oil. If cold applications fail to give relief, a tepid poultice, and leeches occasionally.—Sir Astley Cooper.

† Bread poultices, made with the decoction of poppy-heads.—ED.

‡ If the abscess be quick in its progress, placed in front of the breast, and the suffering not excessive, Sir Astley Cooper leaves it to take its natural course. But if the matter be very deeply situated, its progress tedious, the pain very great, the irritative fever considerable, and the patient suffers from profuse perspiration and want of rest, he prefers discharging the matter with a lancet. "Still it is wrong to penetrate with the lancet through a thick covering of the abscess, as the opening does not succeed in establishing a free discharge of matter; for the aperture closes by adhesion, the accumulation of matter proceeds, and ulceration will continue. On this account, the opening should be made where the matter is most superficial, and the fluctuation is distinct, and it should be in size proportioned to its depth." Op. cit., p. 10.—ED.

§ American practitioners often employ a poultice made of the slippery elm bark (Ulmus rubra

of a well-applied roller will soon obliterate them. In the variety described by Hey, he recommends laying open all the sinuses; but Professor Gibson has found that, in two very extensive and obstinate cases, the milder plan of passing a seton into each of the sinuses, as prepared by Dr. Physic, accomplished a cure.*

With respect to the question, whether the child should be weaned, the following is Sir Astley Cooper's advice. "If the abscess be small, the child may be put to the diseased breast as well as the other; but, if much of the mamma be involved in the disease, the child should be put to the other breast; but that which is inflamed should be drawn by the mother herself, by means of the glass tube constructed for the purpose. As the pump, which is sometimes employed, bruises the breast, and gives much pain, it ought not to be used. As a general rule, it is best to continue the child at the breast as long as the mother's sufferings will admit of it."—(Op. cit., p. 12.)

SPECIES V.
PHLEGMONE BUBO.
BUBO.

TUMOUR SEATED IN A CONGLOBATE GLAND; REDDISH; HARD; DIFFUSE; NOT EASILY SUPPURATING; OPENING WITH A CALLOUS EDGE.

Bubo is a Greek term borrowed from the Hebrew verb בָּעָה or בָּעַע (bo or boa), importing "to swell," and merely doubled according to the analogy of the language, to give it an intense or superlative power, whence bobo, or bubo.

Buboes are chiefly found in the inguinal and axillary glands. They are sometimes simple glandular inflammations, unconnected with any constitutional or foreign evil, and require nothing more than the common treatment; but they are often a result of constitutional affection, and very frequently a symptom of lues and pestis, in which cases they can only be cured by curing the specific taint. Mr. Hunter asserts, that he has seen buboes cured by vomits, after suppuration has advanced.

In an early stage, the inguinal bubo has been confounded with a scrofulous tumour. A nice finger will generally discriminate them with ease. The bubonous tumour is smooth, uniform, and obtusely painful: the scrofulous is to the touch, and sometimes to the eye, a cluster of small tubercles without pain.

of Muhlenberg) as a discutient, and with great success.—D.

* Institutes, &c., vol. i., pp. 206, 207. Sir Astley Cooper recommends the sinuses to be injected with a solution of two or three drops of strong sulphuric acid in an ounce of rose-water, and to apply a similar lotion to the bosom by means of linen wetted with it.—(Illustrations of Diseases of the Breast, p. 11.) For the dispersion of the hardness of the breast, left after milk abscesses, friction with iodine ointment, or camphorated mercurial ointment, or the application of the emplastrum ammoniaci cum hydrargyro, is the common practice.—Ed.

SPECIES VI.
PHLEGMONE PHIMOTICA.
PHIMOTIC PHLEGMON.

TUMOUR SEATED IN THE PREPUCE; DIFFUSE; OBTUSELY PAINFUL; IMPRISONING THE GLANS, OR STRANGLING IT BY RETRACTION.

If, at the attack of inflammation, the prepuce be in its natural state and cover the glans, it cannot be drawn back, and the glans is imprisoned. If it should accidentally have been retracted, or be naturally short and truncated, it cannot, after the inflammation has firmly fixed itself, be drawn forwards, and the glans is strangled. And hence the species offers us two varieties:—

α Incarcerans. Incarcerating phimosis.	The prepuce protracted and imprisoning the glans.
β Strangulans. Strangulating phimosis.	The prepuce retracted and strangling the glans.

The FIRST VARIETY alone is denominated *phimosis* by some writers, the SECOND being distinguished by the term *paraphimosis*, or circumligatura. But the inflammation is one and the same, and the same specific name should express it; for the difference is a mere accident.

This inflammation, like the last, though often produced by common causes, and hence perfectly simple, is often, also, the result of a specific virus, as in lues and blenorrhœa. It arises frequently with great rapidity; the prepuce is prodigiously distended with effused serum, and the mucous glands of the internal surface secrete an enormous quantity of pus before there is any ulceration or breach of surface. If the prepuce be retracted violently, and the glans strangulated, and cold applications and topical bleedings prove ineffectual, it is often necessary to divide the prepuce to set the glans at liberty. And occasionally it is also necessary to perform the same operation when the glans is imprisoned by a protraction of the prepuce: for ulceration is apt to take place under these circumstances in either case, and the matter soon becomes erosive; as much of it as possible, however, should be washed out with a syringe several times a day, and an astringent solution be afterward injected, consisting of alum dissolved in water in the proportion of about a scruple to a quarter of a pint.

The imprisoning phimosis is said to occur not unfrequently from laborious exertion in a very narrow vagina.—(*Essich, in Ziegenhagen Anweisung alle venerische Krankheiten—zu behandeln*, A. D. B., xcv., 421.) I have not met with this result, but often with a lacerated prepuce. In many instances of both kinds, relief has been easily obtained by grasping the penis with a very cold hand, and dexterously urging the prepuce forward or drawing it backward, according to the nature of the case.—(*Andree, on the Gonorrhœa; Hecker, Von Venerischen Krankheiten*, &c.)

When the inflammation is very violent, whether in the strangulated or retracted variety, and

surgical attention has been neglected, gangrene will readily ensue, and an amputation of a smaller or larger portion of the penis may be absolutely necessary. In an instance of an amputation of this kind, recorded by Mr. Jamieson of Kelso, in the Edinburgh Medical Essays (vol. v., art. xxxvi.), the whole of the glans penis was restored by a process of pullulation: the new shoots having at first been mistaken for fungus, and attempted to be destroyed by escarotics. The fresh glans was well shaped and proportioned. [The editor scarcely need observe, that the practice of amputating the penis on account of the risk of mortification from paraphimosis, is entirely relinquished by all the best modern surgeons; and that even the removal of a portion of the prepuce for the relief of phimosis, is much less frequently practised than it used to be. Both cases, when dependant on inflammation, generally yield to milder treatment. In paraphimosis that resists common means, an incision through the constriction will often prevent gangrene; and it is only under very particular circumstances, requiring the glans to be immediately exposed, or where the phimosis depends upon a naturally long constricted foreskin, or one permanently thickened and lengthened by disease, that the removal of any portion of the prepuce is necessary.]

GENUS III.
PHYMA.
TUBER.

IMPERFECTLY SUPPURATIVE, CUTANEOUS, OR SUBCUTANEOUS TUMOUR; THE ABSCESS THICKENED, AND INDURATED AT THE EDGE; OFTEN WITH A CORE IN THE MIDDLE.

PHYMA, a Greek term importing a tuber, tubercle, or small swelling, from φύω, "produco, erumpo," was used among the Greek and Roman physicians with great latitude and no small want of precision: sometimes, as by Hippocrates and Paulus of Ægina, being applied to scrofulous and other imperfectly suppurative tumours; sometimes, as by Celsus and Galen, to tumours perfectly and rapidly suppurative, larger than a bile, but less painful and inflammatory, and without a core or ventricle: and sometimes by other writers, as Celsus also informs us, to fleshy excrescences or warts on the glans penis, which it was then the custom to destroy by caustics. And in consequence of this vague sense of the term, and the latitude of its original meaning, the great body of the Galenists, as Sauvages observes, applied it to protuberances of every kind.

Modern writers have been at a loss in what exact signification phyma should be employed. Linnæus and Cullen have rejected it. Sauvages and Sagar have used it as the name of a distinct and separate order. Vogel, following the example of Hippocrates and Paulus, has reduced it to a genus of imperfectly suppurative and glanduiar tumours; and, as a genus, it thus occurs in Dr. Willan's table of arrangement, including biles, carbuncles, and similar inflammations as its species. This seems to be the most accurate sense; and as such it is adopted in the present system, and made to include sty, bile, sycosis, and carbuncle; in all which we find some degree of imperfection in the suppurative or the ulcerative process of these small abscesses, or in both conjointly; and hence the pus is foul and sanious, or the walls or edges of the abscess are thick and indurated, or the dead matter is not completely carried off, and remains behind in the shape of a core or a fungus, sometimes black and spongy, and sometimes excrescent and granulating.

The following, therefore, are the species included under it:

1.	Phyma Hordeolum.	Sty.
2.	——— Furunculus.	Bile.
3.	——— Sycosis.	Ficous Phyma.
4.	——— Anthrax.	Carbuncle

SPECIES I.
PHYMA HORDEOLUM.
STY.

TUMOUR SEATED ON THE VERGE OF THE EYELID; GRANULAR; HARD; REDDISH; SORE TO THE TOUCH; SUPPURATION CONFINED TO THE POINT.

THE vernacular term *sty*, or, as it is sometimes written, *stian*, is to be met with in the earlier writers, who obtained it from the Saxon, in which *stihan* signifies "a rising, springing up, or ascent;" and hence in Bede's Bible, Mar. iv. 7, *stihon tha thornas*, "up spring the thorns." Wickliffe spells the old English derivation *stigh*, but Spenser, who uses the word frequently, drops both the last letters of Wickliffe, as in the following couplet:—

"To climb aloft and others to excel,
That was ambition, and desire to STY."

From the hardness of the margin of the tumour, and the imperfection of the suppurative process, Sauvages compares it to a small bile; and asserts that it is often the result of a morbid state of the stomach; adding, that he knew a man who uniformly had a sty after drinking ardent spirits. The inflammation, though often very troublesome while it lasts, for the most part readily subsides upon the breaking of the minute abscess, or puncturing it at its apex when mature.

SPECIES II.
PHYMA FURUNCULUS.
BILE.

TUMOUR COMMON TO THE SURFACE; DEEP RED; HARD; CIRCUMSCRIBED; ACUTELY TENDER TO THE TOUCH; SUPPURATING WITH A CENTRAL CORE.

THE bile is a push with a central core; and like the push is found in persons of an entonic or phlogotic habit, with a peculiar susceptibility of irritation: on which account it often makes its appearance successively in different parts of the body, and sometimes synchronously, so that we meet with a crop at a time. This tumour

is therefore chiefly found in persons of high health and in the vigour of youth.

[It is a hard, painful, and highly-inflamed tumour, of a conical shape, the base of which is below, and the apex slightly elevated above the level of the skin. The colour of the tumour is of a dusky red, inclining to purple, and its summit is tipped by a whitish pustule or eschar, beneath which is lodged a mass of disorganized cellular membrane, commonly called the *core*. Although the tumour always suppurates, its progress is slow, and the matter is sanious and ill-conditioned.]—(See *Cooper's First Lines of the Practice of Surgery*, and *Gibson's Institutes of Surgery*, vol. i., p. 48.)

The existence of a core offers a singularity in this affection that is well worth attending to, and shows that, from some cause or other, the ulcerative part of the process is imperfect. Upon Mr. Hunter's hypothesis, this must depend upon a weak action of the absorbents; but as we have already endeavoured to show that the material to be removed must be prepared for absorption, and conveyed to the mouths of the absorbent vessels before absorption can take place, and have suggested that it seems to be the office of the secreted pus to accomplish this purpose, it is probable that, in the furunculus, the pus, from some cause or other, is not quite genuine, and is possessed of a less solvent power than in common abscesses whence a part of the dead matter remains attached to the living after the hollow has burst, and is thrown off from the base by sloughing. [In estimating the value of this theory, one fact should be taken into the account; namely, that it is the nature of a bile to produce a central core or small slough of the cellular membrane; whereas many common abscesses occasion no sloughs whatever, so that the solvent power of their matter on such productions is not in reality tried. The idea that the solids are melted down, as it were, into pus, is now completely exploded.]

The mode of treatment is simple. The diathesis should be lowered by purging, and, if necessary, by bleeding. [The best local applications are poultices and fomentations; and, when the apex of the swelling becomes soft, it may be opened, then poulticed until the core is discharged, and afterward dressed with a solution of lunar caustic or a stimulating ointment.]

SPECIES III.
PHYMA SYCOSIS.
FICOUS TUBER.

TUMOUR EXCRESCENT, FLESHY; FIG-SHAPED; SPROUTING FROM THE HAIRY PARTS OF THE HEAD OR FACE; GREGARIOUS; OFTEN COALESCING; DISCHARGE PARTIAL AND SANIOUS.

The Greeks gave the name of sycosis from σῦκον, "a fig," to various tubers and excrescences, the shape of which was conceived to resemble that of a fig. By Celsus, however, it is limited to a particular kind of inflammatory and imperfectly suppurative tuber of the head and face. Vogel has understood the term nearly in the same sense; and Dr. Bateman has hence correctly described it as such in his list of cutaneous diseases.

It is seated sometimes on the beard, and sometimes in the hair of the head. In the former case it consists of small tumours, hard, roundish, pea-sized; commonly in clusters; occasionally confluent, or running into one another; and spreading from ear to ear: the discharge is small in quantity, and of a glutinous texture, whence the beard becomes filthily matted.

The variety that appears on the head consists of softer tumours of different sizes, and in clusters; they are seated among the hair, and throw forth from a fungous surface an ichorous, copious, and fetid discharge. It is not often that this complaint is connected with any constitutional affection: and, offensive as it is, it will generally be found to yield to cleanliness and mild astringents; of which one of the best is starch-powder alone, or combined with an equal proportion of calamine.* It makes an approach to one or two of the species of porrigo, but has characters sufficiently marked to keep it distinct, and to determine the present to be its proper station.

SPECIES IV.
PHYMA ANTHRAX.
CARBUNCLE.

TUMOUR COMMON TO THE SURFACE; FLAT; FIRM; BURNING; PENETRANT; LIVID AND VESICULAR; OR CRUSTY ABOVE, WITH A SORDID GANGRENOUS CORE BELOW; IMPERFECTLY SUPPURATIVE.

Anthrax is a Greek term correspondent to the Latin carbunculus or carbuncle; literally a small live coal, so denominated from the redness and fiery heat of the inflammation.

The specific definition sufficiently points out its relation to the furuncle or bile, especially when the latter assumes an unkindly or malignant character, from something peculiar in the part or in the constitution. "The inflammation that produces the carbuncle is, however, of a different nature from any of the former: it is stationary," observes Mr. Hunter, "with respect to place, and is pretty much circumscribed, forming a broad, flat, firm tumour. It begins in the skin, almost like a pimple, and goes deeper and deeper, spreading with a broad base under the skin in the cellular membrane. It

* This disease seems also to have been described by Pliny, under the term "*mentagra*," "quoniam à mento ferè oriebatur," and to have appeared with great violence in Rome about the middle of the reign of Claudius. It is sometimes very protracted in its character, and is also liable to recur from neglect. It is occasionally cured by an ointment composed of equal parts of the sulphur and tar ointments, and at times it will yield to a wash of the solution of the chloride of soda. At the Hospital St. Louis, at Paris, it is treated also with internal remedies, as the muriate of gold, arseniate of iron, &c.—D.

produces a suppuration, but not an abscess; somewhat similar to the erysipelatous, when the inflammation passes into the cellular membrane: for, as there are no adhesions, the matter lies in the cells where it was formed, almost like water in an anasarca. This inflammation attacks more beyond the middle age than in it, and very few under it. It is most common in those that have lived well. I never saw but one patient of this kind in an hospital. It appears to have some affinity to the bile; but the bile differs in this respect, that it has more of the true inflammation, therefore spreads less, and is more peculiar to the young than the old, which may be the reason why it partakes more of the true inflammation."—(*On Blood, Inflammation*, &c., part ii., chap. iv.)

The carbuncle occurs chiefly, perhaps uniformly, in weakly habits, and hence often in advanced life. But it is not all debilitated persons who have inflammations that exhibit this disease: and we have here, therefore, another striking proof of the influence of idiosyncrasy, or a peculiarity of constitution, upon the general laws and progress of inflammation; or of a peculiarity of that part of the constitution in which the inflammation shows itself, and, but for which, the inflammatory stages of the present disease would in all probability succeed each other in regular order, and the anthrax be reduced to the character of a common and benign abscess. Of the nature of this peculiarity we are too often able to trace out little or nothing: but, so long as it continues, we have only a small chance of bringing the inflammation to a successful issue.

The carbuncle shows itself under the two following varieties:—

α Pruna. Eschar-carbuncle.	With a black crust; and oozing an erosive ichor, or sanies.
β Terminthus. Berry-carbuncle.	Core or fungus spreading in the shape and colour of the pine-tree berry.

The FIRST of these varieties was called pruna by Avicenna, from its assuming the colour, and often the oval figure of the sloe, or fruit of the *prunus spinosa*, Linn. The SECOND derives its name from its assuming the figure and blackish green colour of the fruit or berry of the pine-nut, or τέρμινθος of the Greeks, the *pinus Abies*, Linn., named by the Latins terebinthus; whence it has been called terminthus and terebinthus indifferently.

As the carbuncle is an inflammation of great weakness set down on a peculiar predisposition, it sometimes shows itself among feeble infants in warm climates. According to Tournefort, in his Travels through the Levant, it attacks them chiefly in the back part of the throat, and proves quickly fatal. He describes it as an endemic in his day, among the islands of the Archipelago.

In more advanced life, for the same general reason, we meet with it frequently in those who have debilitated their frames by an excess of good living, and are verging on the feebleness of age. We may hence also account for its appearing in an early stage of the plague, the most debilitating disease in the whole catalogue.* It sometimes shows itself in great numbers almost on its onset, or *m'drop* as the Arabians call it, who distinguished carbuncles by the name of jimmerat.

When unconnected with any other disease, a cure has been attempted by local stimulants, as cataplasms of tobacco and muriate of ammonia, which has been a common practice in Russia; or of horseradish (*Paré*, lib. xxi., cap. 32), or stone-crop (*sedum acre*).—(*Buchoz und Marquet neueste Heilkunde*, Nüremb., 1777.) Cantharides (*Riverius, Observ. Med.*, lent. iv.), camphire ointments, and lotions of zinc or mercury, have also been tried. More generally, however, it has been attempted to be destroyed or extirpated. Arsenic was recommended for this purpose as early as the age of Agricola, and has been employed in various forms, from that of orpiment to that of Plunket's caustic; above all which, however, Le Dran preferred corrosive sublimate. Riverius used other caustics, and Pouteau the actual cautery, which has, indeed, been very successfully and skilfully adopted of late in a variety of similar affections by M. Maunoir. But radical success must, after all, entirely depend upon supporting and giving strength to the system by cordials and tonics: for, if this cannot be accomplished, it is perfectly clear that the predisposition will be neither subdued nor subside spontaneously: that the ulcerations will not heal, and the system must gradually sink under their constant discharge and irritation.

[The practice most approved in modern times is to apply in the incipient stage fomentations and emollient poultices to the part, and to have recourse, at the same time, to antiphlogistic treatment in moderation. For the relief of the pain, opium is freely prescribed. After a short time, the antiphlogistic is exchanged for the tonic treatment, with bark, cordials, wine, and a nutritious diet. An early, free, and deep crucial incision should be made in the swelling—a method that is to be preferred to the application of caustic to the skin, on account of the latter not procuring an outlet for the matter and disorganized cellular membrane with sufficient promptitude.]†

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* The carbuncle of plague differs from what is met with in this country by being contagious, attacking promiscuously any part of the surface of the body, and the young as well as other persons past the middle periods of life. The common carbuncle, as is well known, has a preference to the posterior parts of the trunk, the nape of the neck, and especially a situation between or over the scapulæ.—Ed.

† In Hays' Cyclopedia of Pract. Medicine, part vi., Dr. Reynell Coates, of Philadelphia, has written an able article on anthrax. Where incisions are required, Dr. Coates advocates the crucial form, as proposed by Dupuytren, and as pursued in several cases with the happiest effect by Dr. C. Drake (N. Y. Med. Rep., iv., s. vi., 462); "yet it is evident," Dr. C. observes, "that there must be many cases in which these incisions are inad-

The carbuncle of cattle is frequently owing to the poisonous sting of various insects; and hence a similar cause has, by some practitioners, been supposed to exist in mankind. Pallas suspects the *furia infernalis*; while others have mentioned the *sirex gigas*, or large-tailed wasp. It is probable that these may have been occasional causes, where there has been a predisposition to the disease in the constitution.*

GENUS IV.

IONTHUS.

WHELK.

UNSUPPURATIVE, TUBERCULAR TUMOUR; STATIONARY; CHIEFLY COMMON TO THE FACE.

Ionthus (Ἰονθος) is, literally, a "violet or purple eruption, or efflorescence," from Ἰον, viola; whose colour is frequently that of a whelky or bubukled face. It includes all those firm and indurated pimples, of whatever description, unconnected with fever, and having a subcutaneous base, with which the face is often disfigured, whether solitary, gregarious, or confluent. These may be comprehended under the two following species:—

1. Ionthus Varus.	Stonepock.
2. ——— Corymbifer.	Carbuncled Face. Rosy-drop.

missible or impracticable, owing to the great extent, or to the location of the disease." Dr. C. claims the application of epispastics as purely American. Its author, Dr. Physic, has not found so much benefit from it as he expected. Dr. Beck, however (N. Y. Med. and Phys. Journ, vol. ii., p. 37), thinks them useful, and Dr. Coates remarks, "that the proper period for their employment would seem to be the commencement of the second stage, and the most suitable cases those in which the extent or location of the tumour interdicts the use of the knife, and which show a strong tendency to spread indefinitely, or to become complicated with diffuse inflammation of the cellular tissue." Dr. Hosack treats anthrax by supporting the strength of his patient by a nutritious and stimulating diet, while at the same time he preserves the tone and action of the part, by frequently washing the tumour with spirits or brandy, and by the constant application of a poultice composed of bark and yest.—(See Am. Med. and Phil. Register, vol. ii., p. 389.)—D.

* The *carbuncle of cattle*, or the *malignant pustule*, as it is named by foreign writers, is not now believed by them to be occasioned in the manner specified in the text, but is propagated on the principle both of an epidemic and a contagious disease. It is one of the few disorders which can be extended from the brute creation to man—the malignant pustule, cowpox, hydrophobia, and the glanders (as clearly proved by the researches of Mr. Elliotson; see Med. Chir. Trans., vols. xvi., xviii.), being perhaps the only four cases* which are of this nature. The itch has sometimes been also specified as capable of affecting both man and animals.—Ed.

* To this list may be added the *milk-sickness*, which, in the eastern and southern portions of our country, has often proved so destructive to human life.—D.

SPECIES I.

IONTHUS VARUS.

STONEPOCK.

TUMOUR RED; HARD; PIMPLY; DISTINCT; GREGARIOUS; SORE TO THE TOUCH; SOMETIMES OOZING A LITTLE FLUID AT THE TIP.

This sort of simple eruption is so common, that there is no one but has seen examples of it; and few who have not at times given examples of it in their own persons. It exhibits two varieties:—

α	Simplex. Simple Varus.	Broad-based, bright red, solid.
β	Punctatus. Maggot-pimple.	Tipped with a black dot, and discharging, on pressure, a grub-like concretion of mucus.

The first, on being firmly pressed with the finger, oozes, at times, a little limpid serum, but no concrete mucus; and even for this it is necessary to make the pressure harder than for the discharge of the mucus in the maggot pimple. The mucus concretes in a follicle, or natural passage, and hence there is less inflammation and soreness than in the simple varus: yet the sides and root of the follicle are thickened and indurated: and hence the papulous elevation. Gouland's lotion, and a few other empirical cosmetics, as white paint of bismuth or cerusse, alike deleterious in their effects, and apt to produce palsy, are a common resource among the multitude for both these varieties. They have sometimes succeeded, with little other sacrifice than the exorbitant price which the purchaser has had to pay for them; but the cure has far more frequently been bought (if there have been a cure at all) at the expense of a ruined constitution, and at the exchange of a temporary local disfigurement for a life of general ill health.

Both varieties are occasionally produced by some internal affection, chiefly of the stomach; as a sudden chill from taking a draught of cold water or cold milk; or eating cold vegetables, as turnips, cucumbers, and melons, when in a state of great heat and perspiration. Catching cold in the feet has sometimes produced the same effect. These are cases of direct sympathy; the torpitude of one organ being communicated to another, which is predisposed to associate in its action.

They have occasionally yielded to powerful sudorifics, and especially when combined with narcotics, as the compound powder of ipecacuanha, in strong doses, taken for several nights in succession, the part affected being at the same time wrapped in flannel. They have also yielded to metallic and terebinthinate stimulants; as eight grains of the compound calomel pill, and a scruple of camphire, made into six or eight pills, and taken daily for ten days or a fortnight. But they generally require some local irritant at the same time; as savin cerate, the camphire or mercurial liniment, or the stronger liniment of ammonia, used so as to excite blistering. Yet, after they have resisted

these and other preparations, with great obstinacy, for years, they have at length vanished beneath a severe attack of fever, or have disappeared spontaneously. The complaint, however, is occasionally hereditary, and bids equal defiance to time, to fevers, and to medicines. Dr. Darwin, under the name of gutta rosea, has a copious collection of cases in point; some of them drawn from old maids, and others from elegant young ladies, and each duly authenticated with initials, to which the reader may turn at his leisure. Among the rest is that of "Miss L., a young lady about eighteen, who had tried a variety of advice for pimples over the greatest part of her face, in vain. She took rhubarb, five grains, and emetic tartar, a quarter of a grain, every night for many weeks, and blistered her face by degrees all over, and became quite beautiful."—(*Zoonomia*, cl. ii., i., iv., 6.)

SPECIES II.

IONTHUS CORYMBYFER.

CARBUNCLED FACE. ROSY DROP.

TUMOURS CONFLUENT; CORYMBOSE; MOTTLED WITH PURPLE: OFTEN DISFIGURING THE NOSTRILS WITH PENDULOUS LOBES.

As the preceding species is produced by a sympathy of the excements of the skin with a torpid state of the stomach, the present is produced by a like sympathy with the liver; and hence it is proverbially regarded as a proof that those who are thus disfigured have indulged too largely in wine and other spirituous potations. So Shakspeare, in describing the physiognomy of a hard drinker, tells us, that "his face is all bubukles, and whelks, and knobs, and flames of fire!!" And in like manner, as I learn from Dr. Perceval, the common name for these protuberances in Ireland is GROG-BLOSSOMS.

The tumours in this species are usually more susceptible of irritation than in the preceding; or, in other words, the cutaneous vessels are in a state of increased debility; and hence they are exacerbated by cordials or exposure to heat.

As this is, in most cases, an habitual affection, or one of long standing, no change of diet, however desirable, should be made suddenly; for this would run a risk of producing dropsy, and, perhaps, paroxysms of atonic gout: but a gradual change to a more sober and temperate regimen is highly to be recommended; and, in the mean time, the patient should have his bowels kept regularly open with warm eccoprotics; as the extract of colocynth and myrrh pill; and be put upon a course of equitation, or such other exercises as may recruit the spirits and invigorate the system generally, in which benefit the liver will become a chief participant. The tumours may not, perhaps, totally disappear, but they will often diminish in magnitude, and assume a healthier hue, or, at least, we shall hereby prevent them from any farther enlargement, and especially from passing into that carbuncular ulceration we have just noticed.

GENUS V.

PHLYSIS.

PHLYSIS.

ULCERATIVE, SUBCUTANEOUS TUMOUR; FLAT; TENSIVE; GLABROUS; DIFFUSED; HOT; THROBBING; AT LENGTH FLUCTUATING WITH AN ICHOROUS MATTER.

PHLYSIS, from the Greek φλύζω, "ferveo," was formerly employed in a very indeterminate meaning, to express cutaneous eruptions filled with any kind of fluid, whether purulent or ichorous: more generally, however, it had a bearing towards the sense of ichorous or vesicular pimples. Dr. Willan has, on this account, correctly limited phlyctænæ, derived from the same root, to this import, in his table of definitions; and such is the restriction of phlysis, and all its compounds, in the present system.

Of the genus now offered, there is but one well-ascertained species; the paronychia, or whitlow.

SPECIES I.

PHLYSIS PARONYCHIA.

WHITLOW.

INFLAMMATION SEATED ABOUT THE NAILS AND ENDS OF THE FINGERS; PAIN ACUTE AND PRICKING, SHOOTING UP THE HAND.

UNDER this species are included the following varieties:—

α	Cutanea. Cutaneous whitlow.	Effusion immediately under the skin.
β	Tendinis. Tendinous whitlow.	Effusion among the tendons.
γ	Periostei. Malignant whitlow.	Effusion pressing on the periosteum.

In the FIRST VARIETY, the ichor, or pus, is poured forth between the skin and the subjacent tendons, to which, however, it is limited.

In the SECOND, it insinuates itself between the tendons and the periosteum; and in the THIRD, between the periosteum and the bone, which is often in the state of necrosis. It is to this last, or malignant whitlow, that the term *felon* is most correctly applied.

Similar inflammations are occasionally to be found in the soles of the feet and palms of the hands. They break through the skin or cuticle with difficulty, from their thickness, and hence become diffused, and, in the latter case, separate the cuticle from the skin beneath.

In the whitlow, the acute and lancinating pain complained of arises partly from the thickness and inelasticity of the skin about the fingernail, but more from the hardness of the finger nail itself; both which act like a tight bandage upon the inflamed part, and do not allow it to swell, or give way to the extravasation. In these cases, therefore, we can easily see why the application of poultices should be of more service than in any other; for they can here act mechanically, or, in other words, their moisture becomes imbibed by the cuticle, as by a sponge, so that it softens, grows larger in its dimensions, and less rigid in its texture; while the nail itself

loses a part of its hardness, and becomes suppler. It is in consequence of the peculiar firmness of the skin around the nail, that the soft parts below are so often seen pushing out through a very small opening in the skin as soon as this has been effected, and appearing like a fungus, but so exquisitely irritable as to give a more impressive idea of soreness than, perhaps, any other kind of ulceration whatever. All this proceeds from the surrounding belts of the cuticle not giving way to the increase of the parts underneath; whence they are squeezed out of this small opening like paint out of a bladder. It is a common practice to eat away this protruded part by escharotics, as if it were a diseased fungus; but this is to give additional pain without any benefit; for the pressure from below will not be hereby diminished. By continuing the poultice the tumefaction will subside, and consequently the pressure cease.*

In the first stage of the complaint, leeches should be applied; and if the inflammation be hereby diminished, it may sometimes be carried off by astringent lotions, or ardent spirits, which excite the surrounding absorbents to additional action.† Most of the causes of inflammation operate in the production of this peculiar affection. It is also occasioned by an incurvation of the nail (*Vicat. Delect. Observ. Prac.*); possibly sometimes by a caries or morbid state of the subjacent bone, in the tendinous and periosteous variety, as ascertained by Siebold (*Chirurgisches. Taschebuch.*, xi.); and Mr. John Pearson has shown that it may occasionally result from a syphilitic diathesis, or any other depraved habit.—(*Principles of Surgery*, p. i.) It seems, moreover, in some cases, to be produced by the bite or burrowing of the larvæ of one or more minute, and, to the naked eye, invisible insects, hatched on the leaves of various field plants, and especially fescue-grass: and is said to be also occasioned by the bite of the gordius *aquaticus*, or hair-worm.

GENUS VI.

ERYTHEMA.

INFLAMMATORY BLUSH.

RED, GLABROUS, TUMID FULNESS OF THE INTEGUMENTS; DISAPPEARING ON PRESSURE; PAIN BURNING; INFLAMMATION ULCERATIVE; TERMINATING IN CUTICULAR SCALES, OR VESICLES; OCCASIONALLY IN GANGRENE.

This genus of inflammation is entitled to a minute and discriminative attention, not only on account of its violence and tendency to an almost unlimited spread, but from its having been very generally confounded with an exanthem* or eruptive fever, which, in one or two of its species, it frequently accompanies, but of which it is then a mere symptom.

[One of the latest writers on erysipelas (or the erythema of the present author) considers it as merely a particular modification of cutaneous, or cutaneous and cellular inflammation. If (says he), we were to class these according to their natural affinities, we should place erysipelas between the exanthemata and phlegmon. It is less diffused than the former; not so circumscribed as the latter. The exanthemata are confined to the skin; erysipelas affects both skin and cellular structure; while phlegmon has its original seat in the latter; the skin being secondarily involved. Phlegmon is a more violent inflammation than erysipelas; but sloughing of the cellular membrane is more frequent in the latter than the former.]—(See *Lawrence on Erysipelas in Med. Chir. Trans.*, vol. xiv., p. 18.)

Erythema, from ἐρυθρος, "rubor," is a term of Hippocrates, who uses it as nearly as may be in the sense now offered; and for which many modern writers of our own country have not unaptly employed the vernacular term INFLAMMATORY BLUSH; since the redness has often very much the appearance of a blush, or glowing suffusion of the cutaneous capillaries. For ERYTHEMA, Celsus and Galen have unfortunately adopted the term *erysipelas*, whence Duretus, in his Latin version of Hippocrates, has used *suffusio erysipelatosa*. And hence erysipelas has been made a very common synonyme of erythema by general writers, while the nosologists, with a few exceptions, have limited erysipelas to that species of exanthem or eruptive fever which is vernacularly known by the name of St. Anthony's Fire; and have revived erythema to express the local affection or peculiar inflammation before us, in which the pyrexy is mostly symptomatic.

Frequently, however, as these two disorders have been confounded, from an indiscriminate application of the same name to both, it will not be difficult to draw a distinctive line between

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* In a late French periodical, the use of mercurial frictions is highly recommended for the cure of P. Paronychia. The writer states that the finger should be rubbed every thirty minutes with some mercurial ointment, and then a dressing of the same should be applied to it. In a few hours the pain is subdued, and the disease arrested.—D.

† Whitlows, not far advanced, sometimes admit of being resolved by the external use of the nitrate of silver, with which the skin is to be stained, in the manner advised by Mr. Higginbottom, of Northampton. The editor had rarely seen a whitlow brought to resolution before this practice had been suggested.—(See John Higginbottom on the Application of Lunar Caustic to Wounds and Ulcers, 8vo., 1826.) When the disease is not immediately relieved by this plan, or other means tried to disperse the abscess, an early opening should be made for the discharge of the matter.—Ed.

* The doctrine of erysipelas being an exanthem, according to Dr. Cullen's definition of the last term, is rather inconsistent. It is correctly observed by Mr. Lawrence, that, although the leading characters of the exanthemata are thus expressed "morbi contagiosi, semel tantum in decursu vitæ aliquem afficientes," Cullen has arranged under this order erysipelas, which attacks the same individual repeatedly, and the contagious nature of which is, to say the least, very doubtful.—(See Med. Chir. Trans., vol. xiv., p. 31.) As, however, Dr. Good's definition of exanthemata is "cutaneous eruptions essentially accompanied with fever," he does not fall into the same kind of contradiction as Cullen did.

them. Erythema bears the same analogy to phlegmon, as erysipelas does to smallpox. Phlegmon is local inflammation tending to suppuration; erythema, local inflammation tending to vesication: smallpox is an idiopathic fever producing a phlegmonous efflorescence. Smallpox is always contagious; erysipelas occasionally so; phlegmon and erythema have no such tendency.

The distinction then between erysipelas and erythema is clear; yet the confusion just noticed has been increased by some writers, who have not only used erysipelas in its popular, yet erroneous signification of erythema, but have also employed erythema in a new and unjustifiable sense; as occurs particularly in Dr. Willan's classification of Cutaneous Diseases; where, while erysipelas is made to embrace both erysipelas and erythema, as these terms have hitherto been commonly used, erythema is arbitrarily appropriated as the name of another collection of cutaneous erubescences of very different characters, and produced by very different causes; some of them primary, others symptomatic affections; some constitutional, and others local; occasionally smooth, papulous, tubercular, or nodose; most of which should be distributed under different divisions.

Thus introduced and explained, erythema, as a genus, will be found to comprise the seven following species, the first three of which are taken with little alteration from Mr. Hunter:—

1.	Erythema Œdematosum.	Œdematous Erythema.
2.	——— Erysipelatosum.	Erysipelatous Erythema.
3.	——— Gangrænosum.	Gangrenous Erythema.
4.	——— Vesiculare.	Vesicular Erythema.
5.	——— Anatomicum.	Erythema from Dissection.
6.	——— Pernio.	Chilblain.
7.	——— Intertrigo.	Fret.

Most of these depend upon a peculiar irritability of the constitution, or of the part in which the inflammation or erythema appears; and the common, though perhaps not the sole cause of such irritability, is debility or relaxation.

Galen, who justly distinguishes between suppurative, or, as he calls it, phlegmonous inflammation, erythematic (with him erysipelatous), and œdematous, ascribes the first, according to the old doctrine of temperaments, to a prevalence of the sanguineous diathesis; the second to that of the bilious; and the third to that of the phlegmatic or pituitous.—(*De Tumoribus, Præternat.*, tom. iii., xx.) That there is generally a peculiar habit in the last two, and often, as we have already observed, in the first, is so clear as to be indisputable; but it is by no means equally clear, that such peculiarity of habit is dependant upon the immediate cause Galen has adverted to. The temperaments of the Greek physicians, excepting when in excess, are not inconsistent with the condition of health; and hence, therefore, in connexion with the temperament, there is usually, in the last two inflammations, a habit of debility or relaxation. And where this exists, the very same stimulus that, in a perfectly healthy frame, would produce a common adhesive or suppurative inflammation, under this state of the system changes the character of the inflammatory action, and urges on the ulcerative process from the first. It usually commences with great violence, and is peculiarly apt to spread; the surrounding parts being easily excited to act or sympathize in an action to which they are prone. Hence, continued sympathy is a common, though not a universal effect; for we sometimes meet with very considerable inflammations confined to the part irritated, notwithstanding that the irritated part evinces great violence of action. Mr. Hunter has illustrated this difference of effect by referring to a piece of paper under two different states, dry and damp. In dry paper, a blot of ink applied to it will not spread, and remains confined to the point of incidence; in wet paper it spreads easily, being attracted by the surrounding moisture, to which it has an affinity.

[The distinction proposed between erythema and erysipelas is well founded; the latter term being restricted by Cullen to a fever that is followed by the peculiar inflammation of the skin, commonly termed erysipelatous. By erythema, Dr. Good signifies merely the local affection of the skin, whether the consequence of fever or not. The only objection to so true a distinction is its interference with the common meaning of the word erysipelas, now more loosely employed in every medical publication, and at every medical school. Yet who will maintain that a fever, leading to a peculiar inflammation of the skin, ought to be confounded with other cases, in which either no fever may precede the local affection, or a fever of a very different kind from what precedes the efflorescence of erysipelas in Dr. Good's sense of the expression? The truth of the latter part of this remark will be illustrated in the history of erythema anatomicum. Why the author, in his definition of erythema, should have introduced the words "inflammation ulcerative," the editor can hardly understand; since erythema, or erysipelatous inflammation, frequently terminates without any ulceration, suppuration, or even vesications. The connexion which the disorder is represented by the author to have with debility as a cause, is another doctrine that does not meet with universal assent. The truth is, that the peculiar state of the constitution or part determining the kind of inflammation, is not known; but, as erythematous inflammation frequently occurs in young and robust persons, as well as the old and debilitated, nothing can be more certain, than that it is not essentially connected with weakness. Mr. Lawrence is quite at a loss to discover in this affection those marks of debility, which some have so much insisted on. Erysipelas, like any other inflammation, he observes, may occur in old and feeble persons, and the effects of the disease, when aggravated by injudicious treatment, or protracted from any cause, will soon weaken the most robust; but, however weak the patient, the local disturbance

is one of excitement; there is increased activity in the circulation of the part, clearly marked by all the symptoms. Indeed, speaking of the part, he is unable to recognise debility as the cause of any inflammation whatever, and, in reference to the seat of disease, he regards the expressions of passive and asthenic inflammation and venous congestion, as either unmeaning, or calculated to convey erroneous notions.—(See *Med. Chir. Trans.*, vol. xiv., p. 28.)]

SPECIES I.

ERYTHEMA ŒDEMATOSUM.

ŒDEMATOUS ERYTHEMA.

COLOUR SCARLET; SPREADING WIDELY AND DEEPLY THROUGH THE CELLULAR MEMBRANE, WHICH OFTEN IMPERFECTLY SUPPURATES, SLOUGHS, AND BECOMES GANGRENOUS.

This is the "œdematous inflammation" of Mr. Hunter, who observes that, when the extravasated fluid is water, it has very much the appearance of the adhesive inflammation, and probably resembles it more nearly than any other erythema, being of a scarlet colour, but much more diffused.

The skin, through the whole range of the intumescence, appears glabrous, and the redness vanishes upon a pressure of the finger, but returns as soon as the pressure is removed. The extravasated fluid is principally serum, and hence the swelling spreads further than the inflammation itself. It is very painful, or, rather, very sore: but has less of the sensation of throbbing than the adhesive inflammation. It is apparently limited to the surface, yet it probably goes much deeper; for the extravasated fluid is in too large a quantity to be furnished by the cells of the cutis alone: but as the swelling and the inflammation do not here keep pace with each other, as in the adhesive description, we have not the same guide to direct our judgment. Coincidently with the remarks already offered, Mr. Hunter observes that "the difference between this and the adhesive inflammation arises, I conceive, from the principle of inflammation acting upon a dropsical disposition, which is always attended with weakness; whereas a greater degree of strength would have produced the adhesive inflammation under the same cause or irritation. And what makes me conceive this is, that, in many cases of anasarcous legs, we have exactly this inflammation come on from distention, which adds to the extravasation of the serum, as well as in most cases of scarifications of œdematous parts to evacuate the water. When this inflammation takes place, it is much more lasting than the adhesive; and, I believe, seldom or never produces suppuration: but if it should run into this stage, it is more general, and the whole cellular membrane in the interstices of parts is apt to mortify and slough, producing very extensive abscesses, which are not circumscribed."—(*On Blood*, part ii., chap. ii., sect. vii., p. 269.)

There is no difficulty in determining why œdematous inflammation should rarely, if ever, produce suppuration, and why it should be of longer continuance. Suppurative inflammation is, generally speaking, the process of a healthy part or habit taking place instinctively for the purpose of removing something that is dead, irritating, or otherwise mischievous, and filling up the space hereby produced with sound living matter. In œdematous inflammation, the part or habit is unhealthy and debilitated; and hence, while there is necessarily less tendency to suppuration, there is less power of recovery.

In some instances the disorder is migratory, of which Dr. Swediaur gives a singular case that had just occurred in his practice. The patient was a robust, sanguineous man of fifty-five years of age, who had for many years laboured under paroxysms of gout, which had returned after certain intervals, but who, at the time, had been free from attack for a longer term than usual. The œdema first suddenly showed itself in the eyelids, and disappeared on the second day, when he complained of pain and swelling in the fauces, with difficult deglutition. This was removed by astringent gargles, when the eyelids became again œdematous; then the neck, and in a few days, in succession, the fingers of the right hand; the fingers itched, became exulcerated, and discharged an acrid humour, and the patient felt well. Some months afterward the same erythema returned, travelled in the same direction, and at last fixed on the feet, which in like manner inflamed, ulcerated, and healed, with a speedy return of general salubrity.—(*Nov. Nosol. Meth. Syst.*, vol. ii., p. 142.)

The general curative intention therefore may be expressed in a few words. It should consist in whatever has a fair promise of giving local or constitutional tone, or both. Hence the benefit of astringent epithems and lotions, whether formed of earths, acids, or metallic oxydes, applied to the part affected; and of stimulants where the action is peculiarly weak, as camphire water, or a solution of the acetate of ammonia, with proof spirit proportioned to the degree of torpor. And hence, as internal medicines, bark, columbo, myrrh, iron, will often be found highly serviceable, in conjunction with a generous diet, pure air, and such exercise as may be taken without fatigue.

[When erythema œdematosum is joined with a general tendency to dropsy, the treatment should be chiefly directed against the latter disease. But, when the local affection is called œdematous merely on account of the copious effusion of serum in the part, and is not combined with a dropsical state of the constitution, some practitioners adopt antiphlogistic treatment, instead of the tonic stimulating plan. Thus, in the beginning of the case, venesection, the free use of leeches, low diet, &c., constitute the practice followed by many surgeons and physicians at Paris for the relief of œdematous erythema.*]

* Roche et Sanson, Nouveaux Elém. de Pathologie, Med. Chir., tom. i., p. 351. Rayer, Traité des Maladies de la Peau, tom. ii., pp. 221, 241; and Lawrence, in Med. Chir. Trans., vol. xiv., p. 49.

SPECIES II.

ERYTHEMA ERYSIPELATOSUM.

ERYSIPELATOUS ERYTHEMA.

COLOUR DEEPISH RED; SUPERFICIAL; WITH A DETERMINED EDGE IN A SERPENTINE DIRECTION; THE PART WHICH HAS PASSED THROUGH THE ACTION HEALING AS THE PART NEXT ATTACKED BECOMES AFFECTED.

THIS is the "erysipelatous inflammation" of Mr. Hunter; and is evidently that which symptomatically accompanies the erysipelas as an exanthem, or eruptive fever. It is more commonly cutaneous, than situated in the deeper-seated parts; although, in some constitutions, almost every inflammation, wherever it takes place, will run deep as well as wide. The skin, however, appears to be most susceptible of its action; for it will spread over a prodigious surface of skin, while it rarely affects even the cellular membrane underneath; and in this respect especially, it differs from the preceding species. [This opinion, that erysipelatous inflammation rarely affects the cellular membrane, or goes more deeply than the skin, is now found to be incorrect. It is only in the slightest cases that the disorder is confined to the skin, and, in all others, an effusion soon takes place in the cellular texture, causing a soft swelling; and this may be considerable, with much tension and a shining surface, when a large part of the body, or an entire limb, is involved.—(*Lawrence*, vol. cit., p. 3.)]—The extravasation, however, is less, than either in the œdematous or even the adhesive inflammation. It appears to support itself by continued sympathy; for it commonly begins at a point, and spreads in a migratory direction, as the part first attacked recovers. This cannot, therefore, be merely constitutional; for, if it were, the parts already inflamed could not recover, while the morbid condition of the constitution disposes the surrounding parts to the same action; but it affords an idea that, when the parts affected have once gone through the action, they lose the morbid disposition and become healthy. This property is not peculiar to the inflammation before us; the ring-worm and many other cutaneous affections have the same tendency.

Mr. Hunter observes, that this inflammation is more common in the summer than in the winter, especially in hospitals; and believes, that it takes place more frequently after wounds on the head than any where else. "I have often," says he, "seen it begin round a wound on the scalp, and extend over the whole head and face, the eyelids being very much swelled and the ears thickened; it has then advanced to the neck, shoulders, and body, creeping along both arms, and terminating at the fingers' ends: the part which attacks the body often descends to both thighs, passes down the legs, and terminates at the ends of the toes. And while this is going on, it is as expeditiously cured behind, and the skin peels off from the cured parts." Sometimes, however, it stops suddenly in its course, and assumes a milder character.

If it proceed deeper than the skin into the cellular membrane, it often suppurates, and at times occasions mortification in the cells by which the air is let loose; and it is this state of the disease that forms the *erysipelas phlegmonodes* of Galen (*Mat. Med.*, lib. xiv., cap. ii.), Van Swieten (*Comment.*, tom. ii., § 723), and many later writers, who have used erysipelas in the loose manner I have already pointed out, as synonymous with erythema. [In Mr. Lawrence's view of this subject, phlegmonous differs from simple erysipelas (erythema erysipelatosum) merely in the higher degree and deeper extent of the inflammation, which not only occupies the whole thickness of the skin and subjacent adipose and cellular tissue, but soon proceeds in the latter to suppuration and sloughing, the skin itself being often involved secondarily in the mortification.]* The effect of this mixture of inflammation produces a strange feel, for it is neither that of fluctuation, nor of crepitation; and as there are no adhesions, the matter finds an easy passage into the common cellular membrane, increasing the same kind of suppuration wherever it goes; and as mortification, and consequently putrefaction, follow speedily, the discharge becomes very offensive. As the parts loaded with effusion seldom ulcerate, they should be opened early; for the fluid either gets into the cellular membrane from the want of adhesions, or separates parts that are only attached, as the periosteum from the bone, or muscles from muscles; while the true suppurative inflammation, on the contrary, ulcerates briskly, and hence should be allowed to burst, or at least should not be opened early.

At the commencement of this inflammation, there is commonly some degree of fever, accompanied with prostration of strength and dejection of spirits, and especially with loss of appetite. But the fever soon subsides, while the inflammation pursues its course; yet since one source of irritation has thus departed, it is less violent, and sometimes assumes a chronic character.

As this, like the last, is a disease of weakness, the same general tonic plan will be calculated to oppose it; and where there is a tendency in the separated skin to crack, absorbent earths or powders should be scattered freely over the ulcerative or oozing parts, to imbibe the acrid fluid as it escapes, or the ulceration will soon become extensive; and the feeble and inflamed subjacent skin, hereby exposed to the stimulus of external agency, will grow gangrenous with great speed. Finely pounded starch is a useful powder for this purpose; as it combines a tonic and an astringent with an absorbent power; so, likewise, is a mixture of equal parts of starch and finely levigated calamine or rhubarb. The last I have sometimes thought peculiarly effectual in checking the irritation; as the second appears to be in preventing the

* Med. Chir. Trans., vol. xiv., p. 9. The *phlegmon diffus* of Baron Dupuytren: the *diffuse inflammation of the cellular membrane* of Dr. Duncan.—(See Edin. Med. Chir. Trans., vol. i.) This form of the disorder often commences and makes rapid advances in the subcutaneous cellular tissue.—Ed.

further spread of the inflamed outline that surrounds the separated cuticle.

This species of inflammation sometimes attacks infants from a very early period after birth; and, what is more singular, they have in a few instances been born with it. In such cases, it appears to be produced by some occasional cause, co-operating with an erythematic diathesis derived hereditarily. It generally assumes the mixed form of phlegmonous erythema, suppurates imperfectly as it takes its course through the cellular membrane, and is often succeeded by gangrene. Its progress is very rapid, from the relaxed state of the infantile fibre; and from the extrication of air, as soon as gangrene is produced, the tumefied surface has the mixed feel, already noticed, of fluctuation and crepitation. It commences usually about the genitals, works its way below towards the thighs and legs, and above towards the abdomen, and often excites on the peritoneum the same caseous or purulent secretion which is so apt to form on this membrane in puerperal fever. As there is no disposition to adhesion, the fluid spreads in every direction, wherever the ulceration makes a way for it; and hence it has often descended in great abundance into the tunica vaginalis and labia pudendi.

Stimulant epithems of ether, alcohol, and camphorated spirits, applied in the first stage of the disease to the parts affected, have been found the most beneficial practice: they act as counter-irritants, and take off the morbid excitement by the production of an artificial and more manageable inflammation. To these ought by all means to be added the use of the bark in any way in which it can be introduced, especially in that of injections, repeated several times a day.*

[Mr. Lawrence rejects the notion that the cause of erysipelas is debility, and adverts to various facts to prove, that it is a complaint of an inflammatory character. Hence, the antiphlogistic treatment is what he particularly recommends. "In contending, however, for the inflammatory nature of erysipelas, and for the propriety of treating it antiphlogistically," he says, "I do not mean to recommend, that measures equally active, and, in particular, that bleeding, whether general or local, are to be employed in all cases. In young persons, in the robust, and those of full habit, in instances where the pulse is full and strong, or when there is headache and white tongue, in erysipelas of the head, attended with symptoms denoting affection of the sensorium, and more especially in the very beginning of the affection, venesection will be proper; and it may be necessary to bleed largely, and to repeat the evacuation, or to follow venesection to the local abstraction of blood. Under such circumstances, the other parts of the antiphlogistic plan must also be employed; that is, the alimentary canal should be cleared by an active purgative, which may be followed by salines and antimonials, with the occasional use of milder aperients; and low diet should be enjoined. Nothing can be more different from such a case, than that of an elderly person, with a small and feeble pulse, in the advanced stage of the disease. The interval between these extremes is filled by numerous gradations, requiring corresponding modifications of treatment. The antiphlogistic plan itself embraces a wide range in point of degree; from bloodletting, local and general, with purging, vomiting, the free use of mercury and antimony, and low diet, to the exhibition of a mild aperient, with some saline medicine. The treatment of erysipelas, like that of any other inflammation, must be modified according to the age, constitution, previous health, and habits of the patient, and the period of the complaint. In asserting, generally, that the antiphlogistic treatment is proper, I speak of the beginning of the disease, when the original and proper character of the affection is apparent; and I am decidedly of opinion, that, in some shape or degree, such treatment will always be beneficial in that stage. In many instances, active antiphlogistic measures are of the greatest service in lessening the severity both of the local and general symptoms. In others, the administration of calomel with aperients, and of diaphoretics with low diet, will be sufficient. When the affection occurs in old and debilitated subjects, the powers of life are soon seriously impaired, and our efforts must be directed rather towards supporting them, than combating the local affection. I have often seen such patients, labouring under erysipelas of the face in its advanced stage, with rapid and feeble pulse, dry and brown tongue, recovered under circumstances apparently desperate, by the free use of bark and wine."—(See *Med. Chir. Trans.*, vol. xiv., p. 41.) Nothing indeed can be more absurd, than to prescribe one plan, either antiphlogistic or stimulating and tonic, for every case, without any regard to the variation of circumstances.]

* This species of inflammation, which affects the genitals of children, seems analogous to that noticed by Burns in his Midwifery. Mr. Kinder Wood has also written on it.—(Med. Chir. Trans., vol. vii.) "In this complaint," says Dr. Francis, "ulceration ensues within a few hours after vesication of the part; the ulcer becomes deep and foul; but mortification is rarely seen. In the treatment of it, bark and cordials internally, and stimulating applications externally, have proved serviceable." The late Dr. Richard Bayley and Dr. John Bard, of New-York, treated cases of this kind by tonics generally, and by the local application of the unguent. basil. nig. The pyroligneous acid, as a wash, may be mentioned as effectual.—(Sherrill, Essay on Epidemics, New-York, 1832.) We have used a solution of the chloride of soda also, *with success.—D.*

SPECIES III.

ERYTHEMA GANGRÆNOSUM.

GANGRENOUS ERYTHEMA.

THE COLOUR DUSKY RED; SUPERFICIAL; CUTICLE SEPARATED FROM THE CUTIS BY A BLOODY SERUM; THE CUTIS, WHEN DENUDED, EXHIBITING DARK BROWN SPOTS, DISPOSED TO BLISTER

AND SLOUGH; OCCURRING CHIEFLY IN THE EXTREMITIES.

THE gangrenous erythema, like the two preceding species, is a frequent companion of debilitated or relaxed constitutions, but is mostly to be met with in advanced age, or weakly adolescence, or infancy; and particularly where, in old age, the constitution has been broken down by habits of intemperance and excess; the circulation is languid, and the blood even in the arteries assumes a venous appearance. The inflammatory stage is in these cases sometimes very slight, and the gangrene is ushered in with very little previous affection.

Either of the preceding species will pass readily into the present, in a warm, stagnant, and corrupt air; for the same reason that all hospital wounds run rapidly into the same state under the same circumstances.

Local applications are here of far less importance than an attention to the general condition of the constitution. Stimulants and perfect cleanliness are perhaps all that are demanded under the first head; while, under the second, pure air, and a steady course of tonic medicines and diet, adapted to the age and habits of the patient, are absolutely indispensable, and can alone furnish any hope of recovery.

How far this disease appertains to the ignis sacer of the Roman writers, will be seen under the ensuing species, which forms another subdivision of the same affection.

[Gangrenous erythema, or erysipelas, seems to the editor not to merit the rank of a distinct species, because it is an effect of several forms of erythema or erysipelas when they are violent, and it is not the exclusive character of any particular example of the disorder. Bad cases of phlegmonous erysipelas present us with the most severe specimens of gangrenous mischief resulting from the disease; the hope of preventing which mischief induced Messrs. Hutchison, Lawrence, and others, to have prompt recourse to numerous or extensive incisions in the part affected.]*

SPECIES IV.

ERYTHEMA VESICULARE.

VESICULAR ERYTHEMA.

COLOUR PALE RED; SURFACE ROUGHISH, AND COVERED WITH CROWDING MINUTE VESICLES, FILLED WITH AN ACRID, OFTEN WITH A REDDISH FLUID; PROGRESSIVELY TRAILING INTO THE NEIGHBOURING SOUND PARTS.

THIS species admits of two varieties, which have been pointed out from the age of Celsus:—

α Benignum. Benign vesicular erythema.
β Corrosivum. Erosive vesicular erythema.

In the FIRST, the redness and vesicles advance without a breach of the cuticle, as the part that has passed through the action is healing.

In the SECOND, the vesicles break in the part first affected, and the erosive fluid produces tracts of sanious ulceration as the redness advances.

Under the present and the preceding species is included the IGNIS SACER of the ancients; about which much has been written, but which has been seldom understood, and never hitherto received a clear methodic position. The author has taken some pains upon the subject, and trusts he will be able to establish the true boundary and character of a disease, not more frequently described by the physicians, than celebrated by the poets of antiquity.

The common error has consisted in making the ignis sacer, or holy fire, an exanthem or eruptive fever; an erysipelas or a pestis: or some other idiopathic fever of the same order. There is no doubt, indeed, that, like the erysipelatous erythema, it has at times been met with as an accompanying symptom in pestis; and, when we shall come to treat of this disease, a distinct notice will be taken of the variety which such an accompaniment produces, and of which the plague of Athens seems to furnish us with a tolerable example; but the ignis sacer, in its genuine and simple state, instead of being marked with a low eruptive fever, has often very little fever of any kind; certainly nothing more than symptomatic fever, and by Celsus is described as being best cured by an ephemeral, or any other fever which may give increased action to the system; hereby proving that this, like the entire group of erythemas, is a result of debility.

In ancient times, some diseases were supposed to be inflicted on mankind by the special interposition of the Divinity or of his ministers; and to these was assigned the name of sacer,

* The experience which the editor has now had in the treatment of phlegmonous erysipelas, leads him to prefer numerous scarifications when the part is merely loaded with serum, and does not contain purulent matter or sloughs. He finds that from the small punctures or cuts, the quantity of fluid discharged will often be very considerable, and afford great relief. In a case which he is now attending, in Eagle-street, Red Lion Square, three pints of serous fluid flowed out of the small punctures in twenty-four hours. This practice is only necessary, however, when cold applications and antiphlogistic treatment fail to check the complaint. If matter form, a free and depending opening becomes immediately indicated. Cold lotions are much more effectual in arresting phlegmonous erysipelas than warm applications; a fact confirmed by Baron Dupuytren's experience, and, for many years, one that has influenced the editor's practice. The skin more frequently sloughs from phlegmonous erysipelas of the lower limbs, than from the same disorder on the head and face; a circumstance ascribed by Dupuytren to the great depth of the tibial and fibular arteries, and their considerable distance from the skin; while the temporal and occipital arteries lie directly under the integuments, to which they afford a very free supply of blood. Also, since the cellular tissue chiefly affected lies under the aponeurosis of the tendon of the occipito-frontalis muscle, a reason may be discerned why the disease should produce less injury of the vessels supplying the skin of the head. Baron Dupuytren, in the whole course of his experience, has seen but one example of sloughing of the scalp from erysipelas.—ED.

or holy; though the peculiar crimes for which they were inflicted, or the names of the particular persons who in this manner first drew down the special vengeance of Heaven upon their atrocities, have not been communicated to us. The later term of Saint or Sanctus, as in St. Anthony's fire or St. Vitus's dance, are of parallel origin, and express corporal punishments first inflicted by the agents or supposed agents of the Deity, whose names they respectively bear. Ignis is a term expressive of the heat, redness, acrimony, and erosive power of a disease; and is hence applied to the present, in common with many other affections.

The best description of the IGNIS SACER that has descended to us from the Roman writers is that of Celsus. He represents it as a genus comprising two species; the first of which is precisely parallel with the species before us, and the second with the *erythema gangrænosum*, or the preceding; and, in order to prevent any doubt upon this subject, the definitions of both species are here given, as nearly as may be, in the words of Celsus himself:—"It has," says he, "two species; one (the vesicular erythema of the present system) is reddish, or a mixture of redness and paleness, rough, with approximating vesicles (*pustulæ*), none of which are larger than the rest, and which, for the most part, are very small. In these are almost always found a fluid (*pus*), and often a red colour with heat."—(*De Medicinâ*, lib. v., cap. xxviii., sect. iv.) Then follows his description of the two varieties just given; the benign and erosive, in the following words:—"sometimes it trails along, the part healing that was first diseased;" corresponding with the variety *α* of the present system; and "sometimes the part ulcerating; in consequence of which the vesicles (pustulæ) break, and the ulceration keeps spreading, and the fluid escapes;" alike corresponding with the variety *β*. Celsus then passes on to describe his second species, which answers to the character and almost to the words of *erythema gangrænosum*, or that we have just considered. "The other species," says he, "consists in an ulceration of the cuticle, without depth, broad, sublivid, but unequally so; and the middle heals, while the boundary lines advance; yet not unfrequently the part that seemed healed again becomes exulcerated; while the neighbouring parts, which are about to receive the disease, grow tumid and hard, and change from a blackish hue; the disease chiefly attacking the legs."

In this passage, the words fluid and vesicles are by Celsus named pus and pustulæ; but that he hereby meant vesicles, and an ichorous fluid, the *φλύκταιναι* of the Greeks, is clear; first, because Celsus thus explains the term in another section of the same chapter; and secondly, because in the ignis sacer, which, as we learn from Thucydides and Lucretius, was a symptom in the plague of Athens, the former has given us *φλύκταιναι*, or vesicles, as the peculiar character of the eruption:—"Yet the body," says Thucydides, "was not outwardly very hot *to the touch, nor* pale; but reddish, livid, and efflorescing with minute phlyctænæ (vesicles) and ulcers" (*Hist.*, ii., 50); which Lucretius has thus forcibly rendered:—

"Et simul ulceribus quasi inustis, omne rubore
Corpus, ut est, per membra SACER quom diditu IGNIS."

"Wide-tinged with purple die, and brandish'd o'er
With trails of caustic ulcers, like the blaze
Strew'd by the HOLY FIRE."

It is perfectly clear then, I think, that the IGNIS SACER of the Roman writers was an erythema, chiefly vesicular, and sometimes gangrenous. It is also perfectly clear, that the present, like the preceding species of erythema, is the result of local or general debility, and requires warm and active local applications, and a tonic and bracing regimen. By later writers, however, the term is sometimes more generalized, and, like pestilence, is employed to denote other affections than the genuine ignis sacer, though making an approach to them.

Where the skin is slightly broken, and the acrid fluid oozes through the minute openings, the vesications should be frequently dusted, as already recommended under the second species, with chalk or starch; or where the latter is too harsh and drying, with a mixture of equal parts of starch and finely levigated calamine; carefully abstaining from all oleaginous or other applications that have a tendency to augment the relaxed state of the fibres.

I have observed that the vesicular erythema is found at times as a symptom in plague; it is also occasionally found in the one or other of its varieties, as a sequel, on the exhibition of mercury in irritable habits; and, under this form, has been occasionally denominated by authors *erythema mercuriale* and *hydrargyria*, as we shall have occasion to notice still further, when treating of syphilis.

SPECIES V.

ERYTHEMA ANATOMICUM.

ERYTHEMA FROM DISSECTION.

INFLAMMATION WITH LANCINATING PAINS ABOUT THE AXILLA, SHOOTING DOWN THE CHEST, USHERED BY SEVERE RIGOURS AND ANXIETY; SUCCEEDING RAPIDLY TO THE DISSECTION OF A FRESH CORPSE, WITH A PUNCTURE OR ABRASION ON THE HAND OF THE ANATOMIST; BLUSH A DEEP CRIMSON, WITH A SPONGY FULNESS, CHIEFLY OVER THE PECTORAL MUSCLE: FEVER A TYPHUS.

In our opening remarks on the present order of INFLAMMATIONS, we adverted to the diffuse and ulcerative kind, which is often found to take place in the cellular membrane, though rarely limited to this texture, from a variety of apparently slight causes, under a peculiar condition of the organ locally affected, or of the idiosyncrasy, or of the habit or manner of life. These causes are very numerous, and in themselves of very different character, notwithstanding the similarity of effect which they often superinduce. Some of them are of a mechanical, others of an animal origin; some are general, others specific

irritants; but in every instance the cause, when first glanced at, is so seemingly minute, that nothing but an established experience of the fact, from a redundance of repetitions, could induce us to predicate so serious and often fatal a result. Among the more common of these causes are venesection; the exposure of a pricked or pimpled finger to the fluids of a recently dead subject; the bite of a venomous serpent; the application of various secreted irritant or chymical acrids to an abraded part of the cuticle; and a small, superficial, but jagged wound, made by a flesh-hook, or other mechanical instrument.

Now all these causes, with the exception of the bite of a venomous serpent or other animal, are perpetually taking place without any mischievous effect whatever. And hence it is obvious, that, unless there be some kind of aberration from the common law or powers of health in the part affected, or in the general frame of the individuals that occasionally suffer from the application of such causes, and thus evince an exception to the ordinary course of nature, there could be no mischievous effect at any time. Of the peculiarity of this aberration, or morbid susceptibility of impression, we know little or nothing. Intoxication seems to have been a predisponent in a few instances; but, as this has not uniformly acted, there must, even at the time, be a something independent of such an excitement, how much soever it may serve as an auxiliary.

Although the symptoms issuing from such causes brought into a state of activity evince, both in their local and constitutional march, a striking degree of resemblance, as well as of uniformity in their descent from case to case, yet they are often not without a considerable degree of anomaly and discrepance of character, with the exception of those which proceed from the apparent contagion of a recently dead body during dissection, or from the bite of the more venomous serpents. The former affection is peculiarly entitled to our attention, from the undeviating tenour of its progress, the frequency of its occurrence, and the wonted fatality of its termination; and an inquiry into its nature may possibly lead us to a somewhat better comprehension of the character of diffuse cellular inflammation from the venom of the more poisonous serpents. The writer has hence given it, for the first time, a distinct, and, as he believes, a deserved place in nosology, and trusts that the name he has assigned to it will meet with the approbation of the profession.

The effect itself has been long observed, and occasionally adverted to; sometimes, indeed, loosely described, though it has not, till of late, very minutely engaged the attention of pathologists. But the repeated cases that, within little more than the last two years, have occurred in England,* Scotland, and Ireland, and have been separately reported by authorities of high reputation, have in the present day fixed the attention of the public upon the subject, and given it an interest that will, no doubt, lead to much clearer views than we are yet in possession of. The third volume alone of the Dublin Hospital Reports (p. 201), contains three cases of this kind, communicated by Dr. Colles; and the first volume of the Transactions of the Medico-Chirurgical Society of Edinburgh (pp. 492, 524, and 563) not less than eleven, communicated to or drawn up from personal observation, by Dr. Duncan, junior: in all of which the leading characters are the same; and particularly in the diffuse blush and spongy feel in the integuments of the side, and the typhous career of the accompanying fever: the chief discrepance being in the degree of pain or inflammatory action in the vicinity of the pricked or abraded part which formed the inlet to the disease.

But while the fact is thus generally admitted, the immediate cause has been very differently explained: some writers having ascribed the inflammation to simple irritation in a constitution or idiosyncrasy of peculiar excitement; others to the irritation of a putrescent fluid; and others again to a specific virus.

The weakest and most inadequate of all these hypotheses is the second, or that which supposes the inflammation to proceed from an absorption of some part of the fluids of the body in a state of PUTREFACTION. Yet it is the hypothesis still adopted by many pathologists of established name, and especially by M. Magendie, if we may judge from his account of the fate of Professor Léeler, who died, as he tells us, "in consequence of the absorption of putrid miasma, which took place by a slight abrasion on one of the fingers of the right hand."—(*Précis Elémentaire de Physiologie*, 2 tom., 8vo., Paris, 1817.) It is an insuperable objection to this tenet, that the disease has occurred in almost every instance upon the dissection of a fresh body, and very rarely after putrefaction has taken place; frequently, indeed, when the examination has been made within twenty-four hours, and, in the case of Dr. Pett, within twelve hours after death. "All the cases," says Dr. Duncan, "which I have observed, or of which I have had accurate reports, except that of Mr. Whitlaw, and No. xvii., occurred after the examination of recent bodies, before they were interred."—(*Trans. Medico-Chir. Soc. Edin.*, vol. i., p. 565.) It is highly probable, indeed, that the process of putrefaction destroys the specific virus, and consequently takes off its effects;* and such is the expressed opinion of Dr. Colles (*Dublin Hospital Reports*, vol. iii., ut suprà): and that in the few cases in which local or constitutional symptoms have followed the dissection of a putrid body, it has rather been from the action of the putrid matter, as a simple acuant on an irritable constitution,

* Case of Dr. Pett, communicated by B. Travers, Esq. Case of Mr. Newby, by Dr. Nelson, Medical and Phys. Journ., Feb., 1823. Id., Aug., 1823. Case of Mr. Rainer, by Dr. Barlow, Edin. Medico-Chir. Trans., vol. i., p. 563.

* Garcilaso de la Vega, in his history of the civil wars of the Spaniards in the Indies, part 2, vol. i., chap. 42, observes, that all the Indians in the Windward Islands poison their arrows by dipping their points into dead bodies.—D.

than from any specific influence. Dr. Duncan's two cases of affection, when the body was putrescent, afford a striking confirmation of this opinion, instead of opposing it; for the first patient is described as being of a nervous, irritable temperament, and the second as being of scrofulous habit.

Under such and similar circumstances, even mechanical and chymical irritants, and diseased secretions of various kinds, though otherwise sufficiently innocuous, are often found to excite not only local but diffuse inflammation, and a sympathetic fever that has sometimes proved dangerous, and even fatal; the symptoms, indeed, being often a pretty close copy of those characterizing the disease before us. And hence many pathologists of the present day, chiefly from the difficulty of detecting a specific virus, have ascribed all the cases of anatomical erythema to the same cause of SIMPLE IRRITATION in a frame thus constituted.

But, in the first place, the disease before us has an essential difference from all the other sources of inflammation in the manner of its onset, and in the state of the affected part; while all the rest OPEN WITH LOCAL INFLAMMATION, originating at the point of injury; the inflammation spreading thence visibly towards the shoulder or axilla, and followed by fever and constitutional disturbance as the result of the local mischief; the anatomic erythema COMMENCES WITH FEVER AND CONSTITUTIONAL DISTURBANCE, while the inflammation first shows itself about the shoulder or axilla; the local point of injury remaining little if at all affected by inflammatory action. There is often, indeed, a severe and lancinating pain, which darts upwards from such point; but, except in a particular description of cases, which we shall notice presently, there is no inflammation worth noticing, even when the pain is altogether intolerable.

And, secondly, the plurality of individuals who have frequently been affected at the same time, as well as with precisely the same train of symptoms, and who have propagated the disease to their attendants, leads us, almost irresistibly, to the same conclusion of a specific source of impression as in other cases of propagable contagion. The same subject that gave rise to the complaint which terminated fatally in Dr. Dease, originated it also, though not to a fatal extent, in Mr. Egan.—(*Dublin Hospital Reports*, vol. iii.) The cases of Mr. Blyth and Mr. Young, narrated by Dr. Duncan (*Trans. Medico-Chir. Soc., Edin.*, vol. i.), were, in like manner, derived from a common dissection, as were those of Mr. Hercey, Mr. Hennen, and Dr. Dumbreck, communicated from the same authority; in each of which, also, one of the anatomists fell a sacrifice, while the others were fortunate enough to recover.

The following, forming another proof, from the pen of Dr. Duncan, is perhaps still more to the point. "Dr. Cumming, a medical practitioner in this city, was present 30th September, 1821, at the dissection of a young woman who died from puerperal fever. Took no share in the dissection, except introducing a fresh thread into the needle which was employed in sewing the body, and was not aware of an abrasion, or having punctured himself in the act of threading. *About eight hours thereafter*, felt an uneasy sensation in the middle finger of the left hand, at the inner side of the flexure of the first joint; when, on examination, there was discovered an angry pimple. Passed a restless night; towards the morning, had a severe rigour, to which supervened symptoms of pyrexia." The disease became established, and, though its progress was less rapid and decisive than general, the patient expired on the eleventh day from the attack. The case, however, is here particularly selected, because it appears that a female who was employed to wash, in the evening after the above dissection, a towel that, in the course of it, had been used instead of a sponge, scratched her finger with a pin which was left in it, and received the same disorder, in a milder, indeed, though still a very alarming degree; but from which she ultimately recovered.

It is unnecessary to accumulate examples. Whatever be the difficulty of conceiving the existence of a specific virus generated shortly after death, and before putrefaction takes place, it is far more difficult to withhold our assent from such an explanation, or to account for such effects upon any other principle.

It may, perhaps, in a slight degree, assist the pathologist in his future inquiries into this obscure subject to observe, that we have ground for believing, that a new and active compound of some kind or other is constantly forming antecedently to the process of putrefaction, at the moment the living power, as well in plants as in animals, is ceasing to exist, and a play of affinities commences, which this power has hitherto restrained. In plants, this usually appears in the form of a saccharine principle, perhaps a saccharine acid; among mankind, in that of a phosphoric acid, and often, from its combination with other elements, of a phosphorescent light. This is particularly the case with those animals that have a peculiar power of emitting, and, perhaps, of secreting light while alive, as the glow-worm, the lantern-fly (fulgora), and the *cancer fulgens*, among insects; among shell-worms, the phola, *medusa phosphorea*, and various molluscæ; and, among fishes, most that inhabit salt water.—(*Hulme, Experiments, &c., on the Light which is spontaneously emitted from various Bodies; Phil. Trans.*, 1800.) All these are found to pour forth a succession of light after their death, till putrefaction commences, but no longer. Yet something of the same kind seems also to take place in various other animals under certain circumstances;—perhaps in all. M. Cuvier tells us, that M. Percy, who, during twenty-five years of war, had under his care more than a million of wounded, and had often been obliged to dress wounds in the dark, had frequently observed a phosphorescent light to issue from them, especially when extensive and dangerous, and where the living power was at a very low ebb. And he found, also, that the best way of

rendering this emanation visible, is that of applying an aqueous fluid, as in the case of reviving the phosphorescent light of the recently dead animals we have just noticed. "In one instance," says he, "a vivid light, a true ignis-fatuus, existed for more than six da s over the wound of an officer who had been dressed with compresses, wetted with pure water only."—(*Analyse des Travaux de l'Academie des Sciences de Paris pour* 1819.)

I pretend by no means to say, that the new and active, but virulent and contagious material, formed, and perhaps always in the human, and apparently in other animal bodies, on the cessation of the living principle, and when the laws of chymistry, hitherto held in subjection by the operation of this principle, now begin to assert their sway, is of either of the kinds I have thus adverted to; I have only endeavoured to draw the attention of the physiologist to the subject, by showing that some peculiar and extraordinary compounds, of a very diffusive and active kind, are assuredly formed on the immediate termination of life, and to urge him to a search after compounds that have not hitherto been explored.

Be the contagious material, however, what it may, it appears to pervade equally all the fluids of the decomposing body, whether natural or morbid; for the disease has followed where the punctured hand has been merely immersed in genuine pus (*Case, Lond.*, &c., *Phys. Journ.*, Aug., 1823, p. 123) that has flowed from an abscess of the stomach, or some other viscus, as well as where it has merely come in contact with the lubricating lymph of serous or mucous membranes; and, as already observed, where it has only touched a towel or a sponge, employed in wiping up the fluids or other materials that have required removal in the course of an examination, or even a thread wetted with the same and pressed through the eye of a needle.

Nor does the character of the contagious material appear to depend in any degree upon the nature of the disease of which the subject submitted to dissection has died. It has followed cases of dropsy, of pulmonary affection, of enteritis, of puerperal fever, of aneurism, and of Cæsarian section.—(*Duncan's Cases in Trans. Medico-Chir. Soc., Edin.*, ut suprà; as also p. 566.) So that the nature of the preceding disease has as little connexion with the virus as the process of putrefaction.

The ordinary progress of the complaint cannot be better described than by copying the sufferings of Professor Dease. His demonstration took place on a recent subject, on February 13, 1819, at one o'clock. He awoke early the ensuing morning with severe rigours, sickness, and acute pain in the left shoulder. On the next day, a slight fulness was observed above the clavicle along the left side of the neck, which could not bear the slightest pressure. On the day succeeding, a colourless swelling was noticed about the axilla, which first suggested the real nature of the complaint: and, on examining the hand, there was found by Dr. Colles the mark of a slight scratch with a superincumbent vesicle. He appeared to improve a little for a day or two, though full, florid, and crimsoning erythema occupied the side in the region of the pectoral muscle, extending downwards. On the morning of the nineteenth he showed delirium, and a vesicle appeared on his forearm, which remained stationary to the last By the next day the erythematous swelling had extended over the entire side of the body from a little below the axilla to the hip; and the swollen part became studded pretty thickly with indurated papulæ; the delirium being more confirmed. On the twenty-first, the inflammation completely involved the axilla, and, on its posterior edge, an abscess seemed to have formed, though there was no fluctuation. At this period, the opposite, or right arm, exhibited an intumescence on its anterior part, occupying about a hand's-breadth of the flexor muscles, which was punctured on the same evening, and discharged about a teaspoonful of serous fluid, but without relief; and, within an hour or two afterward, being the eighth day from the accession of the disease, he expired.

The pathognomonic blush that spreads over the region of the pectoral muscle has a peculiar feel, that is not easy to be described; it yields to pressure like a quagmire, or piece of sponge; and is hence called boggy by Mr. Lizars (*Trans. Medico-Chir. Soc., Edin.*, vol. i., p. 496), and doughy by Dr. Colles.—(*Dublin Hosp. Reports*, vol. iii., ut suprà.) In the case of Dr. Pett, it was found by Mr. Travers (*Lond. Med. and Phys. Journ.*, Feb., 1823, p. 176) to crepitate, a secretion or extrication of air having apparently taken place. There is often a considerable degree of uneasiness in the punctured or abraded spot, which has proved an inlet to the virus, sometimes, indeed, amounting to an agonizing and intolerable pain, though without any visible show of inflammation, or too slight to be regarded. The accession of the fever is usually accompanied with great anxiety and dejection of spirits, and often an unwonted irritability of temper. The nervous and depressing character of the fever is, indeed, obvious from the first, and the patient rarely rallies into any degree of hope or composure, where it proceeds to a fatal termination.*

In very many cases, however, its issue is of a happier kind; and where this occurs, sometimes, about the eighth day, a gentle diaphoresis or diapnoë lubricates the harsh and burning skin, a sound and refreshing sleep succeeds, the pain and inflammation diminish, and the patient advances to recovery in a straight path. But, more generally, an effort is made to form lodgments of imperfect pus, bloody serum, or gangrenous ichor, often of all these combined, in particular parts of the affected side, most commonly indeed in the axilla; which swells into an enor-

* The late Prof. Godman has reported an interesting case of this affection, in the person of the late Mr. Adrian A. Kissam, which terminated fatally.—Amer. Journ. of the Med. Sciences, vol. i., p. 315.—D.

mous bag, and, if not opened by art, bursts spontaneously, and discharges the complicated and pent-up fluid to an amount of several pints; the whole of the cellular membrane on the affected side being broken down into the general mass, with numerous sloughs and skeins of fibres detached from the adjoining muscles and thrown out in loose bundles. The cure is long and doubtful in proportion to the range of the ulceration, and the extent of the gangrene: and the patient is often so much reduced as to be in danger of falling a sacrifice from hectic fever or some other secondary affection. But when he has reached this stage, he generally succeeds in the end, though the skin over the injured part is considerably shrivelled, from the loss of the cellular texture beneath, and often attached to the subjacent muscles.

Such is the progress of the disease when the contagion meets with a habit or constitution favourable to its mischievous action, and which yields at once to its influence. But, as in other contagions, so in the present, we perceive a striking diversity in this respect. The habit or idiosyncrasy of most anatomists, fortunately renders them altogether unsusceptive of its impression, and they escape from its arrest. And hence, in all probability, the reason why but few comparatively are ever affected with this fearful complaint, though handling dead bodies for years, and with hands chapped or punctured in various points.

There are others who seem to possess constitutionally a modified protection, though they cannot escape altogether; in whom the virus finds a less easy course of absorption, and, by being delayed in its progress towards the axilla, opens its assault at the point of contagion, becomes concentrated, and spreads its chief brunt in that quarter. In this case, the disease commences with local, instead of with constitutional symptoms, and the latter are even at last rather a sympathetic sequel, as in numerous cases of simple irritants, than a diacritical part of the disorder. The punctured hand or finger is not only vehemently painful, but swells and becomes considerably inflamed; the inflammation characterized by heat, redness, pain, and enlargement, gradually shoots up the forearm; and, if not checked in its progress, ascends to the shoulder, and fixes itself in the axilla, or spreads still further into the side of the chest. But the virulence is usually diluted as it widens; and though the constitution suffers much from symptomatic fever, the inflammatory action is often confined to the arm alone, where it seems to aim at forming a chain of abscesses from the hand to the elbow, and sometimes to the shoulder or axilla.

This distinction is so clearly marked and closely adhered to, that I have scarcely ever heard or read of a case that proved fatal, where the disease has opened with local inflammation, nor often where it has been accompanied with any great degree of danger: while, on the contrary, nothing can be more dangerous than the same disease, where the constitutional symptoms take the lead. And I gladly avail myself of a confirmation of this remark by my distinguished friend, Mr. Travers, published since the preceding edition of the present work, in which it occurs in the same words:—"Inflammation is not necessary to the most virulent and fatal action of the poison; and, in general, I should be disposed to say of these cases, that the symptoms of local inflammation and constitutional irritation exist in an inverse ratio of severity."—(*Inquiry concerning Constitutional Irritation*, &c., p. 203, 8vo., 1828.) In a few instances, a most offensive smell has been found to accompany the diaphoresis which occasionally breaks forth over the body. In the case of Mr. Whitlaw, Dr. Duncan describes it as "a profuse, dark-coloured, clammy sweat, of a smell so exceedingly fetid and disagreeable, that it could neither be borne by the patient himself nor by his attendants. It was in such abundance as not only to wet his body-clothes, but also the bedclothes, and stained them of a dark colour, so that they could with difficulty be washed white again. When the patient awoke out of this state of slumber, in which he had continued during the perspiration, he felt great relief of all the symptoms."—(*Trans. Medico-Chir. Soc., Edin.*, ut suprà, p. 505.) The diaphoresis was in fact critical; and, so far as I have seen, it never occurs but in those that recover; and usually, if not always, is an accompaniment of the disease where the local symptoms take the lead, and in a considerable degree concentrate the virus. It must not, therefore, be confounded with that cadaverous smell, which is sometimes emitted from the body a short time before death, and is a melancholy harbinger of that event.

The inflammation that most nearly resembles the erythema before us, is that produced by the bite of the more venomous serpents, and especially of the rattlesnake; and as, in all these cases, a specific virus is universally admitted, analogy, in addition to the reasons already urged, leads us to a like cause in the present instance. The chief difference is in the greater degree of virulence or malignity that characterizes the serpent's fang, and the greater rapidity of its mischief. A bite from the fang of the cobra de capello, or hooded snake, the *coluber naja* of Linnèus, generally destroys life in twenty-four hours, and from the fang of the rattlesnake (*crotalus horridus*, Lin.) in a shorter time, if no curative means be had recourse to.*

* This statement requires to be modified. The bites of venomous snakes are very unequal in their consequences, according to the season of the year and the climate; the empty or full state of the poison receptacles at the period when the reptiles bite; the constitution of the bitten person; the penetration of the fang into a vein; and other influential considerations. We have the authority of Professor Gibson, of the United States, in support of this statement. Instances occur, both among the Indians and the white people who inhabit the mountainous and thinly-settled parts of the American States, of almost instantaneous death from the bite of the rattlesnake. On the other hand, he says, it is certain that many persons wounded by this animal have sustained very

In both, the local and constitutional symptoms take place nearly simultaneously, and persevere in their double attack. The bitten limb swells instantaneously from the part affected, and the inflammation shoots with great speed up its entire length to the body; and, if it be the arm, associates the axilla in its malignant career; and, if life continue long enough, darts down the side over the pectoral muscle, and produces there the same kind of erythema as in the disease before us. The vital principle, however, is, from the first, exhausted suddenly, as though by a stroke of lightning; the blood ceases to flow in the smaller vessels of the swollen part; the superincumbent skin feels deadly cold; the action of the heart is so weak that the pulse is scarcely perceptible; the stomach so irritable that nothing can be retained on it; dejection and horror overpower the mind, and a low muttering delirium forms the closing scene.

Very powerful stimulants applied instantly may postpone the catastrophe, and sometimes, even in the bite of the rattlesnake, produce a cure; but if the tide of life be kept moving till the venom has exhausted its malignity, the debility is usually so extreme, that the unhappy sufferer too often falls a victim to the local mischief, when he has even triumphed over the constitutional assault.

A striking example of this occurred a few years ago in St. George's Hospital, in a patient whose progress the present writer watched with deep interest. He took notes on the occasion: but the account has been since given so much more minutely by Sir Everard Home, that he will chiefly copy from his statement.—(*Phil. Trans.*, 1810, p. 75.) The patient, by name Thomas Soper, twenty-six years of age, attempted, Oct. 17, 1809, to raise a rattlesnake, confined in a cage in a public show-room in Piccadilly, by irritating him with a footrule, but the snake continued quiet. The footrule was dropped into the cage, and the man had the rashness to introduce his hand to take it away. The serpent instantly seized upon it, and bit it in two places. The bites took place at half past two o'clock P. M.; and the wounded man instantly applied to a neighbouring chymist, who gave him a dose of jalap, as he considered him in a state of intoxication, from the incoherence of his language, which was probably the effect of great terror. The hand almost immediately began to swell, and he applied for aid at St. George's Hospital by three o'clock, or within an hour after the attack. The swelling had by this time extended half way up his forearm: the skin on the back of the hand was very tense, and the bitten part acutely painful. At four o'clock, the swelling had gained upon the elbow; and at half past four, the pain had extended to the axilla, and the swelling within a short distance of it: the skin was cold, the pulse beat a hundred strokes in a minute; the man complained of sickness, but his answers were incoherent. Ammonia, camphire, and ether were freely administered internally; and the two former were also applied externally.

The symptoms continued to augment, with the exception that the patient was collected at times, and expressed a hope of recovery; but, for the most part, his mind was greatly dejected, and it was often difficult to keep him from fainting. The arm was quite cold; but the swelling extended to the shoulder, and down the side of the body, producing a fulness with evident extravasation of blood, as low as the loins, and giving a mottled appearance to the back on the right side. The surface of the swollen part was very extensively vesicated in the course of the present day (the 18th); there was a tremulous motion of the lips; the fainting fits were perpetually recurring; his limbs twitched; his stomach rejected what was introduced into it and the skin of the whole arm had a livid appearance similar to what is met with in a dead body. Brandy and opium were now given him instead of ammonia, but in the ensuing morning his pulse was scarcely perceptible; his extremities were cold, and he spoke in whispers. He was in this manner kept alive by nutritive and stimulant means; the constitutional symptoms appeared in five or six days to be diminishing, and the venom to have spent its force; insomuch that the present writer made a minute on October 25th, that "he seems, upon the whole, to be recovering." He had not, however, strength enough left to cope with the extensive mortification which had taken place in the arm and axilla, and died November 4th, at half past four in the afternoon.*

In serpents whose venom is less virulent, a ligature tied a little above the bite, and continued for only an hour, will often prevent the action of absorption, and render the disease chiefly local; in consequence of which, as in the local modification of anatomic erythema, the patient escapes with a far less degree of danger. But the most active and malignant of all the serpentine poisons is that of the rattlesnake.

trivial injury.—(See Gibson's Institutes of Surgery.) The poisons of serpents are well known to be most powerful in hot weather, and the procreating season.—ED.

* It is difficult to add much to the important details furnished us concerning the influence of this poison by Sir Everard Home, as given in his history of the case of Thomas Soper.

Mr. Home mentions the intellectual powers of the patient to have been materially affected. Dr. Francis remarks (Facts on Med. Jurisprudence, N. Y. Med. and Phys. Journal, vol. ii.), "in company with the late James Inderwick, of the United States navy, I visited, in the year 1812, a young man, Mr. A——, of New-York, who was seriously bitten in the arm by a rattlesnake, that had been kept in confinement for a public show. The action of the poison, as in the case of Soper, began to manifest its effects within the first half hour, and its local changes, such as great swelling, pain, &c., were also similar to those stated by Sir Everard Home. But in the case of Mr. A——, the mind preserved its wonted functions throughout his whole illness. I have reason to believe, that the action of this poison is primarily through the medium of the sanguineous circulation. When the bite is inflicted in a large vein, its effects are more immediate, and its fatality more certain, than under other circumstances."—D.

All other serpents have an immunity against each other's bite; but the rattlesnake not only kills every other, and even its own kind, but, by being so far irritated as to inflict a personal wound, has been found to kill itself.

A highly stimulant diet, though most essential in the bite of the more poisonous serpents, does not seem to be of equal use in the erythema before us; nor, in the slighter cases, has any benefit been found from the use of a ligature. The excitant plan has been tried by some, and the antiphlogistic by others; but both have often failed, and a remedial mode of practice is still a desideratum.*

Considering the great benefit that results from fixing the inflammation in the hand and forearm, it appears reasonable that our first attempt should be to concentrate or recall it towards the punctured or abraded part; not by destroying the life of such part, as has too often been done by caustics, but by powerful and pungent irritants, as camphire, turpentine, or ammonia. Or, if within half an hour or an hour from the date of the injury, by the application of cupping-glasses; the great benefit of which practice, in preventing the absorption of poison from venomous animals, has been satisfactorily ascertained by Sir David Barry's experiments, as we have already had occasion to remark.—(*See his Experimental Researches on the Influence exercised by Atmospheric Pressure*, &c., 8vo., 1826.) Our next object should be to counteract the inflammation that takes place in the axilla and in the region of the pectoral muscle, by a free use of leeches or cupping-glasses; while the constitutional symptoms should be opposed by opiates and sudorifics. We have already seen the high and critical advantage which has arisen from a general diaphoresis; and the present author has observed more benefit from a free use of Dover's powder acting in this manner and allaying the nervous and constitutional irritation, than from any other medicine whatever. In the meanwhile, the diet should be moderately stimulant, and the bowels must be kept duly open.

* The Guaco plant (*Bejuco de Guaco*) has long been considered by the natives of South America a specific for the bites of poisonous reptiles, and more particularly of the rattlesnake. A document published at Caraccas, in 1832, and signed, "*Un Amigo de la Humanidad*," asserts, that it cures the bites of the most venomous serpents, and even of the viper: and Alibert, in his New Elements of Materia Medica, has stated the mode in which the negroes inoculate themselves with it. The attention of scientific men, however, has but recently been drawn to this medicinal plant, and the experiments as yet made with it, are not sufficiently numerous or accurate to enable one to form a correct opinion of its real value.

In the Jamaica (W. I.) Phys. Jour., vol. i., p. 234, Mr. Higson, a gentleman well known for his botanical researches, and also for his travels in South America, has published a paper on this subject. He begins by remarking, that "the Guaco plant deserves the greatest attention, and its virtues should be made generally known." He then gives the details of two cases which came under his notice, in which the patients had been bitten by an ekkis, one of the most deadly of its species. These were treated by administering the expressed juice of the Guaco internally, and applying the bruised leaves of the same to the wound; and although they exhibited severe symptoms, as swelling and delirium, they recovered. He farther remarks, "I have been thus particular, hoping to dispel some of that skepticism that is so apt to accompany details savouring of the marvellous; but, on the continent south of us, thousands can vouch for the virtues of a plant, placed by Providence where it is most necessary."

Mr. Higson was unable to detect the flowers and fruit of this plant, but thinks he recognises its character in Humboldt and Bonpland's Synopsis Plantarum Equinoctialium, under the generic name Mikania, and species Guaco.—D.

SPECIES VI.
ERYTHEMA PERNIO.
CHILBLAIN.

INFLAMMATION OF A CRIMSON COLOUR, SUFFUSED WITH BLUE; OBSTINATELY ITCHING; CHIEFLY AFFECTING THE EXTREMITIES DURING WINTER.

This species offers us the two following varieties:—

α	Simplex. Simple chilblain.	The cuticle remaining unbroken.
β	Exulceratus. Kibe.	Accompanied with ulceration.

The extremities principally affected by the chilblain are the hands and feet; but, in very cold climates, the nose, ears, and lips are affected also, and the living power is destroyed as completely as by combustion. So correctly has our great epic poet described the power of severe frost:—

"The parching air
Burns frore, and *cold* performs th' effect of *fire*."

That the pernio or chilblain belongs to the genus erythema is perfectly obvious, not only from its symptoms, but from the character of the age and constitution in which it is chiefly to be met with, and from the stimulant mode of treatment by which alone it is to be cured.

The proximate cause of chilblains is a diminution of the excitability or vital energy of the extreme vessels; and, as such diminution is most readily produced in children, or older persons of relaxed fibres, these are most subject to the disease. For, though we often meet with it also in strong and hardy boys, it will usually be found that the last, from the natural vigour and courage of their frames, have braved the cold and rigid reign of the winter season beyond the venture of their schoolfellows.

Local stimulants, then, are the only applications that will answer, and particularly those which serve at the same time to defend the weakened organ from the severity of the external air. Hence, oil-skin socks worn day and night are useful, and warm diachylon or Burgundy pitch spread upon leather still more so. For the same reason, embrocations of spirits of turpentine, opodeldoc, liquor ammoniæ acetatis, or equal parts of vinegar and spirits of wine, will usually be found serviceable. Linnæus recom-

mends bathing the part with diluted muriatic acid; and this has the advantage of being astringent as well as stimulant.* The weakened vessels should never be too much distended, and hence, though gentle warmth and stimulants are indispensable, great heat, and especially a near approach to a fire, and more particularly still when very cold, will always be found injurious. When the inflammation becomes ulcerated, or forms a kibe, warm and irritant dressings will alone succeed in effecting a cure; and, if fungous granulations should appear, which they are very apt to do in all sores accompanied with debility, they must be removed by a dressing of the unguentum hydrargyri nitrati, or some other mild escharotic.†

SPECIES VII.
ERYTHEMA INTERTRIGO.
FRET. EROSION OF THE SKIN.

COLOUR OF THE INFLAMED PART BRIGHT RED; CUTICLE ERODED; THE EXPOSED SKIN OOZING A LIMPID AND ACRIMONIOUS FLUID.

THE fret, or erosion, which frequently takes place in different parts of the skin from an acrid secretion of the exhalants or sabaceous glands, and particularly behind the ears, about the groins, and around the anus, is usually accompanied with erythematic redness, or inflammatory blush; and hence is generally and correctly referred to the present place. It is an erythema with weak vascular action, and often considerable irritability in consequence of such weakness.

The most common example of this species is that which takes place behind the ears of children of a delicate habit, or who labour under irritation from teething, or from gross indulgence in luxuries. The discharge is often peculiarly offensive, and hence cannot proceed merely from defective absorption, for it would then be nothing more than saline without fetor. It cannot be checked too soon; for if it continue for a few weeks, or perhaps even less, it may acquire a habit, the suppression of which may run the risk of superinducing some worse disease than itself, as dyspepsy, diarrhœa, or convulsions. The organ affected should be kept well washed, to prevent the spread of the morbid secretion, and the discharge should be imbibed by dry and scorched rags applied to the part, or starch frequently dusted over it.—(*J. P. Frank, De Cur. Hom. Morb. Epit.*, tom. iv., p. 113, Mannh., 8vo., 1792.) But the irritability is here best subdued by the tonic and astringent powder of many of the metallic oxydes, particularly that of cerusse, which is one of the most valuable, as well as one of those in most common use.

* One part of the tincture of cantharides, and six of soap liniment, equal parts of the liq. plumbi acet. and laudanum, and a mixture of tincture of myrrh and liq. plumbi acet., form common and useful applications to chilblains which have not broken, or assumed the ulcerated state.—ED.

† The eminent operator Lisfranc treats erythema pernio by placing thereon perforated compresses spread with cerate, and covering these with a thick layer of lint, which must be constantly wet with a solution of the chloride of soda or lime.—See Monographie des Dermatoses, par Alibert, tome première, p. 41, Paris, 1832.—D.

GENUS VII.
EMPRESMA.
VISCERAL INFLAMMATION.

DERANGED FUNCTION OF A VISCERAL ORGAN, MEMBRANOUS OR PARENCHYMATOUS; WITH LOCAL PAIN; FEVER MOSTLY A CAUMA; INFLAMMATION MOSTLY ADHESIVE.

THE genus of diseases upon which we now enter, consists of that numerous collection of visceral inflammations which, from the time of Boerhaave, have been generally distinguished by anatomical terms derived from the organ affected, with the Greek term *itis* added as a suffix, as cephalitis, gastritis, carditis, and many others. *Itis* is sufficiently significant of its purpose: it is immediately derived from *ἰεμαι*, which is itself a ramification from *ἰω*, and imports, not merely action, "putting or going forth," which is the strict and simple meaning of *ἰω*, but action in its fullest urgency, "violent or impetuous action." As a suffix, therefore, we shall retain it in its common use, and proscribe it, to prevent confusion, from the few compounds, or proscribe the compounds themselves, in which this common use is departed from; as rachitis, hydro-rachitis, ascites, and tympanites, none of which convey any idea of violent or impetuous action, and some of which are peculiarly marked by a contrary state.

This application of a common term in composition to so large a body of visceral inflammations, and the general use of the term for so long a period as that throughout which it has been employed, is a sufficient proof, that practitioners have discovered between these inflammations other features of resemblance than the general symptoms of inflammatory disorder. In the prosecution of the subject, we shall find that this is the fact; and I have already observed, in the opening remarks upon the present order, that, with a very few exceptions, the inflammation in all the diseases is of the adhesive kind, and the fever a cauma. With a view, therefore, of simplifying, as far as simplicity may be of real use, the present system will, for the first time, comprise the whole of these under one genus, here distinguished by the name of EMPRESMA, or "internal inflammations;" a term, in its simple form, employed both by Hippocrates and Galen, and which it seems necessary to revive for the present purpose.

Many of the organs included under the genus before us, and which we shall presently follow up in their respective order, sympathize with each other, and most of them with the stomach. The necessary consequence of which is, that the constitution is disturbed generally, though in very different degrees, according to the organ affected; or, in Mr. Hunter's opinion, according to the different degree of its connexion with the stomach.

If the heart, the lungs, or the brain, be the

flamed, whether primarily or secondarily, as by sympathy, the stomach is peculiarly influenced, probably from the essential importance of these organs to life itself (as all the vital organs, or those essential to life, maintain a very close degree of affinity); and the disease originating in any of these has, in consequence, a more violent effect upon the constitution than the same quantity of inflammation would have if it were not in a vital part, or in one with which the vital parts do not sympathize. The pulse, in such cases, is much quicker and smaller than when inflammation takes place in a common part, as a muscle, cellular membrane, or the skin. The progress, moreover, when the attack is so violent as to prove fatal, is, generally speaking, far more rapid than in other parts; so that, at its very beginning, it has the same effect upon the constitution, as a farther advance of an inflammation in other organs that is equally sure of proving fatal in its result. The debility commences early, because the inflammation itself is immediately interfering with actions essential to life; and, as already observed, the sympathy between these organs is peculiarly close, insomuch so as almost to make any single action common to the whole.—(*Hunter, on Blood,* &c., p. 325.)

In inflammation of the brain, the pulse varies, perhaps, more than in inflammation in any other part; and we must rather depend upon other symptoms than upon the state of the pulse. It is sometimes quick, sometimes slow, sometimes depressed, sometimes full, according as the disease is characterized by the acute pain, delirium, stupor, or other concomitants.

When inflammation is seated in the heart, its action becomes extremely agitated and irregular. When in the lungs, the heart, possibly from sympathy, does not seem to allow of a free diastole.

If the stomach be inflamed, the patient feels an oppression and dejection through all the stages of the disease. The vital energy, or simple animal life, seems to be impaired and lessened in the same manner as sensation is lessened when the brain is injured. The pulse is generally low and quick; the pain obtuse, but urgent and overwhelming; so that the patient can hardly bear up under it.

If the intestines be affected, the symptoms are nearly of the same kind, especially if the inflammation be in the upper part of the canal; but, if it be seated in the colon, the patient is more roused, and the pulse is fuller than when the stomach itself is inflamed.

If the uterus be the organ attacked, the pulse is extremely quick and low: if one of the testicles, the pain is depressing, and the pulse quick without much strength. With the uterus, the testicles, and the intestines, the stomach peculiarly sympathizes; often, indeed, as much as if itself were primarily affected. If we contrast these species of inflammations with those that attack parts not very essential to life, but with such a degree of violence as to produce universal sympathy and affect the vital functions, we shall find that, in the latter, the pulse is fuller and stronger than common; and the blood is pushed further into the extreme arteries. The attack usually commences with rigour; the patient then becomes somewhat roused, because the action of the part is roused, and the effects on the constitution are not yet such as to impede the operations of the vital organs. Much, however, will still depend upon the nature of the parts, whether active, as muscles, or inactive, as tendons; as also upon the situation of the same description of part, and especially upon the character of the constitution; for, if the last be extremely irritable and weak, as in many women who lead sedentary lives, the pulse may be as quick, hard, and small, even at the commencement of the inflammation, as in inflammation of the vital parts. The blood, moreover, may be sizy, but will be loose and flat on the surface. It is singular to observe how very rarely the pancreas is subject to inflammation, or even to disorders of any kind. "The pancreas," observes Dr. Baillie (*Lect. and Obs. on Medicine*, 1825), "is upon the whole less liable to disease than any other important gland in the body. I do not recollect that, in private practice, I have met with one case in which there was satisfactory evidence of the pancreas being diseased; and I have only known of a solitary example of it during the thirteen years in which I was physician of St. George's Hospital." [Now, however, that morbid anatomy is more extensively and zealously cultivated than it was thirty years ago, examples of diseased pancreas are more frequently met with. On the whole, however, the pancreas, like the salivary glands, to which it is analogous, is, comparatively speaking, seldom diseased. This subject is noticed in a preceding part of this volume.]

Having premised these general remarks, we are the better prepared for examining the relations which the numerous species belonging to the present genus bear to each other, and satisfy ourselves with a more summary account of several of them than would otherwise be necessary.

These species are as follow:—

1. Empresma	Cephalitis.	Inflammation of the Brain.
2. —— ——	Otitis.	—— of the Ear.
3. ——	Parotitis.	Mumps.
4. ——	Paristhmitis.	Quinsy.
5. ——	Laryngitis.	Inflammation of the Larynx.
6. ——	Bronchlemmitis.	Croup.
7. ——	Pneumonitis.	Peripneumony.
8. —— ——	Pleuritis.	Pleurisy.
9. ——	Carditis.	Inflammation of the Heart.
10. ——	Peritonitis.	—— of the Peritoneum.
11. —— ——	Gastritis.	—— of the Stomach.
12. —— ——	Enteritis.	—— of the Bowels.
13. ——	Hepatitis.	—— of the Liver.

14. Empresma Splenitis. Inflammation of the Spleen.
15. ——— Nephritis. ——— of the Kidneys.
16. ——— Cystitis. ——— of the Bladder.
17. ——— Hysteritis. ——— of the Womb.
18. ——— Orchitis. ——— of the Testicles.

SPECIES I.

EMPRESMA CEPHALITIS.

INFLAMMATION OF THE BRAIN.

PAIN IN THE HEAD; AVERSION TO LIGHT; FACE MORE OR LESS FLUSHED; CAUMA.

THE pathology of cephalitis, or inflammation of the brain, is, in some degree, obscure and difficult, from the difference which occurs in several of its secondary or concomitant symptoms; occasioned partly, perhaps, by the difference of its exciting cause, partly by the particular portion of the organ that is primarily or chiefly affected, and partly by circumstances which seem to baffle all research. From this occasional difference of symptoms some nosologists have endeavoured to establish as many distinct affections, and have hence multiplied a single specific disease into a considerable number of distinct species, and even genera, and treated of it under a fearful host of distinct names: and hence the disease before us has been described, not only under the term cephalitis, but under those of phrenitis, paraphrenitis, phrenismus, sideratio, siriasis, sphacelismus, typhomania, calentura, and a great many others, which have burdened the medical vocabulary, and perplexed the medical student.

The disease may commence in the meninges, or membranes of the brain, or in the substance or parenchyma of this organ. [In its activity, it varies from the highest degree of acute to the lowest degree of chronic or scrofulous inflammation, and with numerous modifications, by which the different forms pass into one another by almost insensible gradations. It may terminate by serous effusion; by the deposition of false membrane; or by a peculiar softening of the cerebral substance.—(See *Abercrombie's Path. and Pract. Researches on Dis. of the Brain*, p. 5, 8vo., Edin., 1828.)] If it were to confine itself strictly to the part first affected, instead of spreading from one part to another, there would perhaps be no great difficulty in determining from the symptoms before us its direct and actual seat; for while membranous and muscular inflammation, before the access of gangrene, is accompanied with an acute and rousing pain, great heat, and a pulse considerably and permanently quickened, parenchymatous inflammation is rather distinguished by a heavy and often a stupifying pain, a slight increase of heat, and a pulse irregularly quickened, sometimes sinking even below its natural standard.—(*Hunter, on Blood, &c.*, p. 288, 289.)

Now both these conditions are occasionally found in different cases of cephalitis; and we may hence infer, that in the one instance, the disease is seated chiefly, if not altogether, in the meninges, and, in the other, in some part of the substance of the brain itself, thus presenting to us the two following varieties:—

α Meningica. Phrensy. Brain fever.	Pain in the head acute; intolerance of light and sound; cheeks permanently flushed; eyes red; watchfulness; delirium; pulse rapid.*
β Profunda. Deep-seated inflammation of the brain. Acute dropsy of the head.	Pain in the head obtuse; cheeks irregularly flushed; pulse irregularly frequent; eyes oblique; sleep heavy, but unquiet; and occasionally interrupted by screams. Chiefly common to children.

The above clear and distinctive marks, however, by which the two varieties are separated from each other in exact cases, are not often to be met with; as each, for reasons already given, is apt to assume something of the character of the other.† And hence they have hitherto

* Cruveilhier infers from some cases which he has published, that what he terms "la meningite sous-arachnoidienne de la convexité du cerveau," has for its pathognomonic character a stupor gradually increasing to complete coma; and he is of opinion that headache, exaltation of sensibility, delirium, and convulsions, are frequently entirely absent.—(Anat. Pathol., 6me livr.) When this affection occurs towards the base of the scull, accompanied by acute dropsy of the ventricles, vomiting is set down by this pathologist as usually one of the first and most predominant symptoms, so as often to raise suspicion that the patient's disorder is in the stomach.—ED.

† The following remarks by Dr. Quain are judicious and interesting:—"An examination," says he, "of the structure of the brain, and of the peculiarities of the circulation in it, would also lead to the inference, that if the meninges be the seat of inflammation, the contiguous cerebral substance must participate in some degree, in the irritative influence. In other organs, the vessels, after entering them by trunks and branches of various sizes, branch out and ramify in their interior, until they become capillary in their spongy and areolar tissue. But in the brain a different arrangement takes place; the vessels, after entering at the base of the scull, communicate freely with one another, and then branch out upon the surface of the brain, ramifying in an extended web of cellular tissue (pia mater); in this way they become reduced to so great a degree of tenuity before they enter the substance of the organ, that it may be said to be surrounded by a vascular atmosphere, from which its supplies are derived. Hence it is, that as the meninges and the contiguous cerebral substance are supplied from the same source, each will, more or less, become affected by any inflammatory action set up in the other. M. Bayle, in his Thesis, gives six cases of what he considers chronic arachnitis, and in all of them the arachnoid membrane was thickened, opaque, and resisting, and there was found some serous effusion; but in five of these cases, portions of the cerebral substance were adherent to the membranes, and so much softened

escaped the attention of almost all our nosologists, even of those who have subdivided inflammation of the brain into the greatest number of distinct genera or species of disease; while Vogel expressly declares, that all the most acknowledged symptoms of inflammation of the brain are equivocal, not only as to a distinction of one morbid part from another, but as indicative of inflammation in any part; and Dr. Cullen asserts, in a note subjoined to his *generic* definition (for he advances the disease to the rank of a genus, and a genus too without a species or a specific character), that there are no symptoms capable at all times of distinguishing, with certainty, inflammation of the brain from inflammation of its meninges. On which account, he deviates from the more complicated arrangements of Sauvages, Linnéus, and Sagar, and includes several of their genera in his own definition, which runs in more general terms as follows:—"pyrexy severe; pain of the head; redness of the face and eyes; intolerance of light and sound; watchfulness; fierce delirium, or typhomania."

There is so much correctness in this remark of Dr. Cullen's, notwithstanding the error of his arrangement, that the present author yielded to it in the first edition of his Nosology, and introduced cephalitis, not indeed as a naked genus without a specific character, but as a single species without enucleating its varieties; or, in other words, without treating of deep-seated inflammation, constituting acute internal dropsy of the brain, separately from inflammation of the head generally. It may, perhaps, be doubted, whether acute dropsy of the brain ought to be regarded as an idiopathic inflammation at all, and consequently whether the present is the proper place for it; but the reasons which will immediately be advanced will, I trust, settle this point completely. And as, upon a closer attention to the subject, notwithstanding Dr. Cullen's remark, I am induced to think that there are cases in which parenchymatous or deep-seated inflammation may be distinguished from meningic, I have so far deviated from the first arrangement as to give these distinctions under the form of the above varieties.

I admit, nevertheless, with Dr. Cullen, that there are no symptoms capable *at all times* of distinguishing, with certainty, inflammation of the substance of the brain from inflammation of its meninges; and only contend, that the distinction may be drawn in certain cases in which the disease is simple, and the characters strong and unmixed; and strikingly indicative of membranous or parenchymatous inflammation, according to the general rules just laid down upon this subject.*

It is possible, indeed, that meningic inflammation may occasionally be still more limited, and exist chiefly or altogether in one of the membranes alone, as the arachnoid; whence some pathologists have set down ARACHNITIS as a subvariety of the meningic form: but, as such minute derivations can never be supported by pathognomonic symptoms, nor lead to any practical utility, I cannot but prefer the example of Professor Frank, and, indeed, of most of the Italian pathologists, in rejecting them, to that of Pinel and other French writers,† in introducing or retaining them.

[Dr. Abercrombie, who uses the term *meningitis* to express inflammation of the arachnoid or pia mater, or both, as distinct from inflammation of the dura mater, finds that it is not characterized by any uniformity of symptoms. In some cases, it comes on with headache, vomiting, fever, and impatience of light, but more commonly with a sudden and long-continued paroxysm of convulsions, sometimes preceded by headache and vomiting, sometimes without any warning. In some examples, the convulsion passes immediately into coma, which afterward alternates only with a repetition of the convulsion, until death. In other cases there is a recovery from the first convulsion, and the patient appears to be doing well; but afterward falls into coma, with or without a recurrence of the convulsion; while, in certain other instances, no convulsion occurs till a late period of the disease.

On the other hand, inflammation of the substance of the hemispheres is said to be attended with symptoms which also vary considerably, according to the extent of the disease, and the particular part of the brain which is the seat of it. In some cases, headache is followed by

as to be brought away with the latter, when an effort was made to detach them: in five of them, the pia mater was injected, thickened, and infiltrated with serous fluid. MM. Martinet and Parent, in their elaborate monograph on arachnitis, give the results of their examination of 116 cases, published with the expressed design of establishing the diagnosis and pathology of arachnitis. But though these are classed as inflammations of a serous membrane, we find, that in a considerable number of them, the inflammation had extended to the cerebral substance, the vessels of the pia matter being at the same time injected, and its substance thickened and covered with a serous or sero-purulent effusion; so that, judging from the *post-mortem* appearances, they were, in fact, mixed cases; and in strictness, we must refer the symptoms, or physiological indications presented during life, to the lesion of the cerebral substance, rather than to that of the meninges."—Dr. Quain, in Cyclop. of Pract. Med., art. INFLAMMATION OF THE BRAIN.—Ed.

* According to Bayle, delirium and progressive paralysis are the invariable accompaniments of chronic meningitis. The delirium is at first partial; it is a monomania, with weakness of intellect; but, after a time, it passes on to the maniacal excitement, and finally subsides into confirmed idiocy. The paralysis does not amount to a total privation of motion and sensation in any particular part; it is at first slight, but gradually increases, and extends to the whole muscular system, rendering the gait feeble and vacillating, and ultimately destroying the power of motion. The diminution of sensation is not proportioned to that of motion. Spasmodic movements, with contraction and rigidity of the limbs, sooner or later set in; and, finally, epileptic attacks, which terminate in fatal apoplexy.—Ed.

† Recherches sur l'Inflammation de l'Arachnoide, &c., Par P. Duchatelet, M. D., &c., et I Martinet, M. D., 8vo., Paris 1821.

high delirium, and this by coma. In others, there is a sudden attack of convulsion. A frequent form of the disease is characterized by headache, followed by convulsion of one or more limbs: these afterward becoming paralytic. The disease may be fatal in the inflammatory stage: that of ramollissement, simple or combined with partial suppuration; that of undefined suppuration; that of encysted abscess; of that or ulceration of the surface of the brain.*]

I believe that a simple and unrestricted appearance of inflammation is more frequently to be traced in meningic, than in profound or parenchymatous cephalitis; or, in other words, that, in primary inflammation of the substance of the brain, the meninges are more disposed to partake of the affection, either by continuous action or sympathy, than the substance of the brain is in primary inflammation of meninges. And hence, those nosologists that describe but a single species or *genus* of this disease, as it has been often though incorrectly denominated, like Vogel, Cullen, and Parr, lean chiefly to the meningic variety, and define it by characters of great vehemence or acuteness, so as in reality to limit themselves to this variety alone. Yet, as the symptoms do not always, nor even most frequently, mount up to this aggravation, in consequence of the disease more commonly originating, or being more commonly seated, in the substance of the brain itself than in its membranes, they have all been dissatisfied with their respective definitions; and, instead of enlarging or modifying their terms to meet the distinctive phenomena as they vary according to the seat of the disease, have endeavoured to apologize for their own inaccuracy, by representing these phenomena as irreducible and anomalous.

The first variety, therefore, exists in the judgment and even in the description of all writers, who, where they have not entered into more minute subdivisions, have given it as the general character of the complaint.

The existence of the second variety, or, in other words, the propriety of regarding what has hitherto been denominated acute or internal hydrocephalus as a variety of cephalitis, requires to be examined somewhat more at length.

The absurdity of the usual arrangement of internal hydrocephalus, and of contemplating it as belonging to the ordinary family of dropsies, with which it has scarcely a common symptom, has long been felt by pathologists, and is directly noticed both by Sauvages and Cullen. But the question is, if we remove it from its usual situation, where are we to place it? If we do not regard it as a dropsy, in what light are we to contemplate it at all? And how are we to regulate our treatment of it? The Professor of Montpellier tells us, that, according to its symptoms, it is to be ranked in the comatose, spasmodic, or some other tribe of diseases: distinctly importing that, in his own opinion, he could not refer it to any single division in his very extensive classification. Dr. Cullen's reply is, that it is an evident and idiopathic species of *apoplexia*, and ought to take its place under that genus; and he has hence distinguished it by the appellation of apoplexia *hydrocephalica*, and in this manner assigned it "a local habitation and a name." In reference to this assignment he observes, however, that, in a nosological work, it is difficult to collate exactly diseases that, in their progress, assume a changeable form, and hence to allot a perfectly fitting place to hydrocephalic apoplexy. "Yet I prefer," says he, "placing this disease under the head of apoplexy to placing it under that of hydrocephalus (dropsy of the head); first, as it differs extremely from the symptoms of sensible (external) dropsy of the head; and next, as in its proximate cause, and at length in its symptoms, it bears to apoplexy as near a relation as possible."

Dr. Cullen evidently regarded the effusion or dropsy in the ventricles of the brain as a mere effect of the disease, rather than as the disease itself; yet the drowsiness, or heavy sleep, or whatever else there is akin to apoplexy, and which he contemplated as the proximate cause of the disease, and consequently as the disease itself, is a still more remote effect than even the effusion, for it is probably the mere result of such effusion. In truth, it is only necessary to

* See Abercrombie's Pathol. Pract. Researches on Diseases of the Brain, pp. 50, 70. This eminent pathologist candidly owns, "that our knowledge is not sufficiently matured to enable us to say with confidence what symptoms indicate inflammation of the substance of the brain, as distinguished from that of its membranes." Yet, as Dr. Quain has pointed out, there are circumstances in which we can indicate, with sufficient precision, the symptoms of cerebritis, as distinguished from any that can, in strictness, be referred to meningitis; for instance, when the inflammation is isolated, and does not reach the membranes, as where it is seated in the thalamus, or corpus striatum. But if the inflammation occur at the circumference of the organ, where the membranes and cerebral substance are in contact, and both are supplied by the same vessels, then, though the inflammation may at the outset be seated in the meninges, it will speedily extend, more or less, to the cerebral substance, and, by complicating the lesion, confuse the diagnosis.—(Dr. Quain, in Cyclop. of Pract. Med., art. INFLAMMATION OF THE BRAIN.) It is an observation made by the same physician, that if we note the symptoms commonly ascribed to inflammation of the arachnoid membrane, we shall find that several of them must really depend upon a disturbance of the functions of the cerebro-spinal mass, and not of its investments; as, for instance, delirium, spasm, and rigidity of the muscles, convulsions, vomiting, stupor, coma, contraction or dilatation of the pupils, strabismus, &c. In the great majority of superficial inflammations, it appears to Dr. Quain that there is a mixed lesion, and all that discrepance which their progress and symptoms present is explicable, not merely by the extent and degree of the inflammation, or by peculiar idiosyncrasy, but by the fact that, in some of them, the inflammatory action is, for the most part, expended on the membranes; that, in others, the reverse obtains; while, in a third group, it seems as if concentrated on the vessels of the pia mater, the arachnoid on the one hand, and the brain on the other, being but slightly affected.—ED.

run over Dr. Cullen's specific definition of this disease, to see how very little it has in common with apoplexy. This definition is as follows :—"Apoplexy arising gradually; affecting infants, and the age below puberty, *first* with lassitude, feverishness (*febriculâ*), and pain of the head; *afterward* with a slower pulse, dilatation of the pupil, and somnolency." The definition includes two stages of disease, if not two distinct diseases, a primary and secondary: and it is only in the second stage or secondary disease, the mere result of the first, that it bears any analogy to apoplexy.

The first and leading symptoms are evidently those of pyrexy, which is, therefore, the fundamental part of the disease; and had not Dr. Cullen been in some degree influenced by system, he would probably have coloured these symptoms a little more highly, as he might have done without any departure from the truth. And hence, while Dr. Parr, Dr. Young, and a few others, have adhered to Dr. Cullen's view of the subject, the great body of pathologists have been dissatisfied with it, and have correctly carried internal hydrocephalus over to the class of pyrexies, and regarded it as a fever or an inflammation. Thus, in Dr. Macbride's table, it occurs as a nervous fever, under the title of febris continua, nervosa, hydrocephalica: and more simply under that of febris hydrocephalica, in Professor Daniel's edition of Sauvages; while Dr. Quin of Dublin, Dr. Withering, Dr. Rush, Dr. Golis, Professor Martini, and a host of other writers of authority, have contemplated and treated it as an inflammation —an inflammation of the brain—and consequently a cephalitis, in the language of Dr. Coindet, Céphalite interne *hydrencéphalique* (*Mémoire sur l'Hydrencephale, par J. F. Coindet, M. D.*, Geneva, 1818); in that of Dr. Golis, *wasserschlag* (*Prakt. Abhandl. über die vorzüglicheren Krankheiten des kindichen Alters.*, band. i., Wien, 1815), or water-stroke, from its violence; the fever being regarded as a mild and somewhat irregular cauma, and the effusion into the ventricles of the brain as a mere effect of the inflammation.

This is not the only instance, indeed, in which cauma assumes a mild character. In various other species of empresma it is often found to do the same, of which the reader will find an interesting example under the species laryngitis, a few pages further on: and of which every practitioner is meeting with daily instances in pneumonitis, and especially in inflammation of the parenchyma of the lungs producing suppuration. The general organ of the brain, however, seems to have less irritability than almost every other organ when in a state of health, and we often find it to be little irritable in a state of lesion; since nothing is more common than for a bullet, or the broken point of a knife, sword, or other weapon, to be forcibly driven into it, and buried there for weeks, months, or years (*Gooch's Cases; Hoegg. Diss. Observ. Medico-Chir.*, Jen., 1762), in one instance eleven years (*Majanet, Journ. de Med.*, tom. xli., *p. 65; Id., tom.* xx., p 553), not only without danger, but sometimes with little inconvenience.

In the third number of the Medico-Chirurgical Journal there is an excellent paper upon the subject before us, by Dr. Porter of Bristol, which commences with a very correct pathological view of the disease, minutely coinciding with the present arrangement, and confirming this view by a variety of strongly-marked and well-selected cases. And I am glad to avail myself of Dr. Porter's authority in following up this second variety of cephalitis into a distinct and extended illustration.

[The view adopted by the foregoing authorities and by Dr. Good, receives important corroboration from the statements of that distinguished pathologist, Dr. Abercrombie, who has observed (*On Diseases of the Brain*, p. 19; also, *Dr. Mills, in Trans. of Assoc. of King's and Queen's Coll. of Physicians*, vol. v., p. 353), that, in the earlier investigations of this class of diseases, too much importance was perhaps attached to the effusion, as if it alone constituted the disease called acute hydrocephalus. The symptoms were ascribed to the compressing influence of the effused fluid, and the practice was directed chiefly or entirely to the promotion of its absorption. It is now, says Dr. Abercrombie, very generally admitted, that the effusion in acute hydrocephalus is to be considered as one of the terminations of inflammatory action within the head, though there are certainly other causes from which the serous effusion may arise. Dr. Mills proposes to call the acute species, arising from inflammatory action, *hydro-cephalitis*.]

In a few words, both varieties not only evince symptoms of inflammation during the progress of the disease, but anatomical proofs of the same upon dissection after the disease has terminated fatally; in the meningic subdivision, the complaint commencing in and being ordinarily confined to the meninges or membranes of the brain, the bloodvessels chiefly affected with inflammatory action being the meningic branches of the external carotid; and, in the deep-seated subdivision, the complaint commencing in, and being ordinarily confined to, the posterior part of the brain, the bloodvessels chiefly affected being minute branches of the basilary artery. It is nevertheless possible, and appears often to become a fact, from the anastomoses that are occasionally found between different arteries of the brain, from the continuous spread of morbid action from neighbouring sympathy, or from some unknown cause, that either variety may pass still deeper or wider into the substance of the brain, and make an approach towards the other; and hence the mixed, anomalous, and even contradictory symptoms, by which the specific character is sometimes distinguished (*J. P. Frank, De Cur. Hom. Morb. Epit.*, tom. ii., p.48); a striking example of which, but too long to be quoted, is to be found in the Edinb. Medical Commentaries.—(Vol. ix., p. 164.)

"In three cases," says Dr. Sagar, "I have found suppuration of the brain after death; in each of which the patient during the progress of

thedisea se breathed sonorously, but without stertor."—(*Syst. Morb. Sympt.*, Cl. XI., Ord. III., Gen. XII.) Whether, in the case of effusion between the membranes, the fluid be confined, where the disease commences in the meninges, to the space between the dura mater and the arachnoid tunic, and where it commences in a contiguous part of the brain, to that between the arachnoid tunic and the pia mater, as asserted by Dr. Porter, I have not been able to determine.

We may hence explain why the symptoms of irritation and oppression should so much vary, as we find they do, in different cases; why there is sometimes no delirium, and at other times a considerable degree; why the delirium is sometimes furious and impetuous, constituting the *delirium ferox* of medical writers; why, in other instances, it is mute or muttering, designated by the phrase *delirium mite*; why there should occasionally be examples of that comatose or heavy stupor to which the Greeks gave the name of typhomania; and why the pain and pyrectic symptoms should vary from great acuteness to a mere disquieting headache and slight increased action: as also why, in a few cases, there should not only be found suppuration, but examples of that mollifaction, or softening of the brain, the *Ramollissement de cerveau* of M. Rouchoux (*Dict. de Méd.*, tom. ii., Paris, 1822) and other French writers, which is more frequently traced in apoplectic subjects, and of which we shall have to treat when discussing the disease of apoplexy.

Except in a few cases, in which it is brought on by the abuse of strong liquors, and, in warm climates, by exposure to the intense heat of the sun (*Abercrombie*, op. cit., p. 6), PHRENSY is not often found as an idiopathic complaint, though it is a frequent attendant upon other diseases, as synochus, worms, various exanthems, trichoma, hydrophobia, injuries of the brain, and severe grief. [The diagnosis of inflammatory affection of the brain, as laid down by Dr. Abercrombie, seems faithful and correct. His account, however, refers to inflammation of the brain, in its several modifications and consequences, and not merely to acute cephalitis. In the head: violent headache, with throbbing and giddiness, sense of weight and fulness, stupor, a great propensity to sleep. In many obscure and insidious cases, a constant feeling of giddiness is the only remarkable symptom. In the eye: impatience of light, unusual contraction or dilatation of the pupil, double vision, squinting, blindness, distortion of the eyes outwards, paralysis of the muscles of the eyelids, objects seen that do not exist, long-sightedness suddenly changed into ordinary vision. In the ear: transient attacks of deafness, great noise in the ears, or unusual acuteness of hearing. In the speech: indistinct or difficult articulation, unusual quickness or slowness of speech. In the pulse: slowness and remarkable variations in frequency. In the mind: high delirium, transient fits of incoherence, peculiar confusion of thought, and forgetfulness on particular topics. In the muscles: paralytic and convulsive affections. In the urine: frequently a remarkable diminution of the secretion, often joined with a frequent desire to void it.*

In this important diagnosis, as Dr. Abercrombie justly remarks (Op. cit., p. 17), minute attention to the correspondence of the symptoms is of more consequence than any particular symptom. Thus, the peculiar oppression which accompanies a high degree of fever, is not an unfavourable symptom; but the same degree of oppression occurring without fever, or with a very slight fever, would denote a head affection of much danger. A degree of headache and delirium, accompanying a high fever, would only be symptomatic; but accompanying slight fever, would indicate a dangerous affection of the brain.] Cephalitis sometimes makes a near approach to mania; but is easily distinguished by the nature of the exciting cause, where this can be ascertained, the abruptness of the attack, and the violence of the fever; added to which there is in phrensy, for the most part, though not always, a hurry and confusion of the mental powers, a weakness and unsteadiness of mind, which is rarely or perhaps never to be met with in genuine mania. It sometimes, however, runs into mania, of which Stoll has given a singular instance in a chronic case that continued for nine weeks before it assumed this change.—(*Rat. Med.*, sect. iii., p. 179.)

[From circumstances noticed by Dr. Abercrombie it appears probable, that, in this form of the disease, the inflammation is primarily seated in the membranes of the brain. Another affection of frequent occurrence, referred by Dr. Abercrombie to this head, is characterized by a peculiar aberration of mind, without any complaint of pain. There is a remarkable restlessness, quickness, and impatience of manner, obstinate watchfulness, and incessant rapid talking, the patient rambling from one subject to another, but often without any actual hallucination; he knows persons about him, and answers distinctly questions put to him. The pulse is rapid, but other symptoms of fever are absent. The disease is sometimes mistaken for mania, and set down as not dangerous, though often rapidly fatal. On dissection, the chief appearance is a highly vascular state of

* The undisturbed state of respiration, in the great majority of cases of simple cerebral inflammation, seems to admit of explanation by Sir Charles Bell's discoveries respecting the origin and functions of the respiratory system of nerves. Large portions of the brain may be destroyed, and extensive regions of the body deprived of sense and motion; but, as long as that portion of the medulla which gives origin to the nerves of respiration continues free from irritation and inflammation, the functions of respiration and circulation proceed without interruption. When, however, the general inflammation or irritation extends to the medulla, as happens in the paroxysms of convulsions which sometimes occur in cerebritis, the respiration then becomes extremely hurried.—See Dr. Crawford's Obs. in Cyclop. of Pract. Med., art. INFLAMMATION OF THE BRAIN. —EDITOR.

the pia mater, without any actual result of inflammation.

A second modification of inflammation of the brain, particularly described by Dr. Abercrombie, is that which comes on with a sudden attack of convulsion, followed by palsy, and putting on the appearance rather of an apoplectic, than of an inflammatory affection. It is generally connected with inflammation of a portion of the cerebral substance, but may also occur in combination with inflammation of the membranes. This modification may also take place in a more chronic manner, in which it continues for months. In such cases it is generally distinguished by headache, often confined to one side of the head; loss of memory; affections of various organs, as the eye, the ear, or the tongue; convulsive affections; palsy of one limb or one side of the body; terminating in coma and death. On dissection, *ramollissement* or suppuration of a part of the brain is generally met with; but sometimes the part is of a dark colour, and rather firmer than the surrounding parts.—(Op. cit., pp. 7 and 17.)

A third modification, noticed by the same physician, most commonly affects children, but sometimes adults. It is usually preceded for a day or two by languor and peevishness, which are followed by fever, sometimes ushered in by severe shivering. The patient complains of acute pains in some part of the head, with flushing of the face, and impatience of light. In many cases, there is frequent vomiting. The pain frequently extends along the neck, and is sometimes complained of in the arms and other parts of the body. The pupil is usually contracted; the eye is morbidly sensible, and sometimes suffused; the tongue generally white; the sleep is disturbed by starting and frightful dreams; the bowels are mostly confined; but frequently they are natural, and sometimes loose. After some days, slight delirium begins, or a peculiar forgetfulness shows itself, the patient using one word instead of another, misnaming persons and things, &c. These symptoms are followed by a tendency to sleep, soon changing to coma. While these symptoms are going on, the pulse, which was at first frequent, usually falls to the natural standard, or below it; the pain becomes less violent; the eye loses its acute sensibility, becoming dull and vacant, often with squinting and double vision; and these are often succeeded by dilated pupil and blindness, even before the patient falls into coma. The pulse having continued slow for a day or two, sometimes only for a few hours, begins to rise again, and attains extreme frequency, and occasionally that of two hundred in a minute. Through the whole course of the disease, according to Dr. Abercrombie, it is extremely unequal in frequency, varying perhaps every minute, and every time it is counted. This remarkable inequality, he says, is not observed in other diseases, except from some temporary cause; and is, in all affections of the head, a symptom deserving much attention. The patient is now perfectly comatose, sometimes with paralysis, sometimes with convulsions; and, after a few days more, the disease proves fatal. The falling of the pulse, while the child continues in a state approaching to coma, is often the first symptom indicating the alarming nature of the disease.

A fourth form of the disease, depicted by Dr. Abercrombie, proceeds with slight headache and febrile disorder, with remissions and aggravations for several days, ere the case assumes any decided character. The headache, though not severe, is now remarked to be greater than is correspondent to the fever; and while the pulse falls, and the appetite improves, the headache continues. After a few more days, the pulse sinks even to the natural standard, while the headache is increased, with an evident tendency to stupor. This instantly marks a head affection of the most dangerous character, and the patient now lies for several days in a state of considerable stupor, sometimes with convulsions, often with squinting and double vision. The pulse then begins to rise again; some amendment seems to take place; but a relapse into perfect coma soon follows, and death takes place in three or four days.

A fifth variety, pointed out by the same practical writers, begins with violent headache, but without fever. The pulse is about the natural standard, or even as low as 60. In some cases, the face is flushed; in others, rather pale. The eye may be natural, or it may be impatient of light, with contracted pupil. There is a look of much oppression, and sometimes there is vomiting. Delirium frequently appears at an early period, and in five or six days passes into fatal coma, the pulse having continued from 70 to 80 through the whole course of the disease. In other cases, the pulse is at first above the natural standard, afterward falls to 60 or 50; and at last rises to 120 or 130. In some cases vision is not affected; in others, squinting and double vision occur; and sometimes these symptoms, after lasting a day or two, cease, yet the disease goes on to its fatal termination. In every case there is more or less delirium, though often slight and transient; and frequently the patient lies in a dozing state, and talks incoherently, but is capable of being roused so as to converse sensibly. This condition, says Dr. Abercrombie (Op. cit., p. 6–13), when not accompanied by fever, is always characteristic of a dangerous affection of the brain.]

The remote causes of cephalitis are those of inflammation in general applied to the organ affected; such as sudden exposure to cold after great heat; cold liquors incautiously drunk in the same state; inebriation, and especially from spirits; exposure of the naked head to the rays of a vertical sun; violent passions of the mind; obstructed menstruation; accidental injuries; suppressed eruptions of various kinds (*Frank*, ut suprà, tom. ii., p. 51); and several kinds of poison.

From some of these causes, the inflammation assumes a chronic character; is slow in its progress, and obscure in its symptoms. The symptoms, moreover, however connected with a morbid consent in other organs, generally

point to the brain as the seat of lesion; and consist of cerebral compression or acute pain in the head, irregularity in the pulse, and some kind of paralysis. M. Lallemand, who has industriously collected a multitude of anomalous cases of this kind, observes, that where the inflammation runs into suppuration, an effort is usually made by nature to form a sac or barrier for its limitation; but that even this effort is often in vain, and still adds to the fatal issue, as the new membrane frequently becomes thickened, and creates a fresh source of irritation.—(*Récherches Anatomico-Pathologiques sur l'Encéphale et ses Dépendances; Lettre quatrième*, 8vo., Paris, 1823.)

[According to the valuable researches of Dr. Abercrombie, the disease may be fatal: 1st, in the inflammatory stage; 2dly, from serous effusion; 3dly, from deposition of false membrane; 4thly, from suppuration; 5thly, from peculiar disorganization, or softening of the brain, or its conversion into a soft pulpy mass, retaining its natural colour, and without the appearance or smell of pus—the *ramollissement* of French writers; 6thly, the terminations in the chronic form are, thickening of the membranes, contraction and obliteration of the sinuses, caries of the bones, &c.]

The cure of phrensy must be attempted in the same manner as that of inflammation in general, or rather as the cure of inflammation by resolution; for resolution is the only means by which a cure can be effected in this case. Copious and repeated bleedings must here therefore hold the first place, and the nearer the blood is drawn from the affected organ, the better chance it gives us of success. The temporal arteries and the jugular veins have hence been recommended as the most effectual vessels to open; but for various reasons it is better to begin with drawing blood liberally from the arm, and afterward by a free application of leeches to the temples. The head should be shaven as soon as possible, and kept moist with napkins wrapped round it dipped in cold vinegar, or equal parts of water and the neutralized solution of ammonia; or, which is still better, with ice-water: all which is preferable to blistering, which is too apt to increase the morbid excitement; and the practice has the authority of Hippocrates, who was in the habit of applying cold epithems, not only in inflammation of the brain, but even of the abdominal viscera.—(Περὶ Νουσῶν, p. 484.) The effect of blistering in the early stages is looked upon by Dr. Abercrombie (Op. cit., p. 156), as rather ambiguous. When it is employed, he recommends it to be on the back of the head and neck, where it will not interfere with the more powerful remedy, the application of cold. After the first violence of the disease has been subdued, however, he approves of successive blisters to various parts of the head and upper part of the spine.] The bowels should be thoroughly evacuated, and even stimulated, at first by calomel alone, or mixed with jalap, and afterward kept open by cooling saline aperients; nitre should be given in moderate quantities, repeated as frequently as the stomach will bear; and it is often considerably assisted by the tincture or infusion of digitalis. The chamber should be cool and airy; and no more light be admitted than the eyes can endure without inconvenience.

[In cases which assume a more chronic character, Dr. Abercrombie (Op. cit., p. 156) represents the abstraction of blood as having less control over them. In all forms of the disease, he says, active purging is the remedy from which we find the most satisfactory results; and though bleeding is never to be neglected in the earlier stages of the disease, his experience is, that more recoveries from head affections of the most alarming aspect take place under the use of very strong purging, than under any other mode of treatment. He deems croton-oil the most convenient medicine for the purpose.]

I have said that furious delirium, though generally laid down as a pathognomonic of this variety of cephalitis, does not always occur; and in a very strongly-marked case in which I was consulted several years ago, the mental powers were not much interfered with.

PROFOUND OR DEEP-SEATED CEPHALITIS, or, as it is more commonly called, ACUTE OR INTERNAL HYDROCEPHALUS, so far as examinations after death may be depended upon, is almost always accompanied with effusion into the ventricles of the brain; on which account, indeed, the name of HYDROCEPHALUS has been applied to it, though most incorrectly; for I cannot but agree with Dr. Porter, that it has no other symptom in common with chronic or idiopathic HYDROPS CEREBRI, and that such a generalization has been a cause not only of much confusion in nosology, but of much mischief in practice: and hence Dr. Coindet proposes, while he retains HYDROCEPHALUS for the latter, as already observed, to distinguish the former by the name of HYDRENCEPHALUS.

This disease is sometimes found in adults, but mostly in young subjects, and chiefly from early infancy to seven years of age, particularly in those of a fair complexion. After seven years the disease is comparatively rare.

[Dr. Mills has recorded the cases and dissections of twenty patients who fell victims to acute hydrocephalus. Of these, twelve died before they attained the age of six; seven between their sixth and eighth year; and one at the age of twelve.]—(*Trans. of the College of Physicians*, vol. v., p. 434, Dubl., 1828.)

The symptoms commence obscurely, and are those of irritation produced by worms: as irregularity, and especially costiveness in the bowels; listlessness; impatience; knitting the brows into a frown; heaviness of the head, which organ the patient is always desirous of reposing in a chair or some other place; irregular fever; and occasionally violent and deep-seated pain in the sensory, shooting from temple to temple, or across the forehead; frequently accompanied with sickness. Sprightliness, vivacity, and good-temper, sink into dulness; the brightness of the eye becomes dim, and the colour of the cheek vanishes; the child walks unfirmly, as though stepping over a threshold

and often staggers as if drunk. The pulse is irregularly quick; the sleep unquiet and interrupted by screams; and the eye has a look peculiarly oblique or squinting. These three last symptoms are usually regarded as pathognomonic. The eye, however, instead of taking an oblique direction, is sometimes turned upwards: but either change is the result of spasmodic action; the pupil is often at first contracted, but at length unalterably dilated.—(*Cheyne, Essay on Hydrocephalus.*) The pyrectic symptoms appear chiefly in the evening, but sometimes at other periods; for, in this respect, there is a strange and unaccountable anomaly; and as the disease advances, they increase. The head is hot to the hand, though without any flush; a severe pain is felt in the forehead, sometimes shooting back to the nape of the neck, or alternating with pains in the limbs, or with colicky gripings, and the stimulus of light becomes highly painful. Shortly after which, many of the symptoms are apt to assume deceitfully for a few hours, perhaps a day or two, a milder character; but the pulse evinces less power, the limbs become emaciated, stupor supervenes, occasional convulsions, more or less general, follow, and death very speedily closes the scene.

So imposing is the apparent improvement at times, that Dr. Gölis candidly tells us (*Praktische Abhandlungen*, &c.), in two instances he dropped his unfavourable prognosis, and thought the little patients on the point of recovery. But a relapse after thirty-six hours in the one, and forty-eight hours in the other, took place, and was speedily followed by death.

I have thus given a brief sketch of the symptoms that principally mark the progress of this disease in all their versatility; and it is this versatility that has produced the chief differences of opinion concerning it.

The first symptoms are unquestionably rather those of irritation than of compression, as is obvious from their resemblance to those of invermination. The venous system in children, indeed, and especially the veins of the head, are not disposed to plethora, which is rather a characteristic feature of advanced years; nor does the small quantity of water which is often found in the ventricle, seem adequate to the violence of the effect; and we have hence very strong grounds for supposing that the collection of water is only a secondary disease, dependant upon some previous idiopathic affection in some part of the brain; and that affection, as Dr. Rush has long ago very ably shown, an inflammation. It has indeed been observed, in opposition to this opinion, that acute hydrocephalus is less frequently to be met with in strong and vigorous, than in weak and sickly children, dropsy being here, as in other species, far more commonly an effect of debility; while it is in strong and vigorous children alone that we have reason to expect inflammatory action in the brain, as in any other organ. Bleeding, it is admitted, has been serviceable at times; but we are told that it has often been unproductive of any benefit whatever; and that it is possible to account for its occasional utility by other means than its taking off inflammatory action, as by simple removal or diminution of venous congestion. Yet we have already observed that venous congestion is not commonly a disease of infancy, but of later life; that the first symptoms are those of irritation; that post-obit examinations have very generally shown an inflamed state of the arteries; and that the fluid accumulated is not sufficient in many instances of itself to account for the symptoms by which the disease is characterized.

[Many facts on record exhibit a large quantity of fluid in the brain, without any alarming symptom having resulted from it. Morgagni found eight ounces in a man who died suddenly of suffocation in an advanced stage of pneumonia; and Dr. Heberden found the same quantity in a man who sunk rapidly, after having been weakened by a febrile attack, without any symptom of an affection of the brain. It is, therefore, as Dr. Abercrombie justly remarks (Op. cit., p. 147), not the mere presence of a certain quantity of fluid in the brain that gives rise to the symptoms of hydrocephalus; all of which, on the other hand, have been known to occur and terminate fatally without any effusion. The conclusion deduced from these facts by Dr. Abercrombie is, that the prominent symptoms in these cases are not the result of effusion, but of that disease of the brain, of which the effusion is one of the terminations.]

In the progress of the complaint, there is often a very singular irregularity in the quickness of the pulse, which seems to be always varying and untrue to itself; insomuch that, if we count it several times in succession, we may chance to find it now eighty strokes, now a hundred, now a hundred and twenty or thirty strokes, and, immediately afterward, not more than eighty or ninety in a minute.

[Some physicians are much more confident than others of being always able to detect the existence of the disease. The most characteristic symptoms of its first stage, as pointed out by Dr. Mills, are, a peculiar expression of countenance, indicative of oppression, pain, and despondency; frequent sighing; a disposition to retirement; a heat, weight, pain, or heaviness of the head, or all these combined; intolerance of light; waywardness and fretfulness; a low irregular fever; frequent nausea or retching; an irregular state of the appetite and bowels; and the continuance of the disease, notwithstanding the employment of aperient medicines.

The diagnosis of the second stage Dr. Mills considers less difficult. The heavy sigh, the deep moan, the wild scream, the preternatural dilatation or contraction of the pupils, imperfect or lost vision, delirium, difficult deglutition, paralysis of one hand, arm, or leg, of the eyelids, and of the sphincters; the head and neck permanently bent back; a slow intermitting or a rapid pulse; frequent vomiting and convulsions, are symptoms which Dr. Mills represents as characteristic of the stage of effusion.

On the other hand, Dr. Abercrombie does not recognise any certainty in the diagnosis, and

has published various facts which tend to prove that none of the symptoms can be depended upon as a certain indication of effusion. Slowness of the pulse, followed by frequency, squinting, double vision, dilated pupil, paralytic symptoms, and perfect coma, he says, have been noticed without any effusion. He further shows that all these symptoms may exist in connexion with a state of the brain which is simply inflammatory.]

The duration of the disease is equally uncertain; commonly, perhaps, it runs on from three to six weeks before it proves fatal; but it will sometimes destroy life in a fortnight, or even a week. Dr. Coindet has occasionally known the patient sink in two or three days. [According to Dr. Mills, acute hydrocephalus, which is the most frequent, commonly lasts from seven to twenty-eight days; chronic, from one to six months; though occasionally protracted to one, two, three, or even sixteen years.

According to Dr. Abercrombie's researches (Op. cit., p. 21), the seat of effusion varies in different cases. It is found in the ventricles under the arachnoid, between the arachnoid and dura mater; and there is every reason to believe that it also takes place between the dura mater and the bone, though the fluid effused in this situation escapes when the head is opened. It is occasionally met with in the cavity between the layers of the septum lucidum. Cases are recorded in which the effusion was confined to one of the lateral ventricles; a state which Dr. Abercrombie has never seen, and which must have depended upon an obliteration of the communication between the two ventricles. Nosologists divide hydrocephalus into internal and external, according as the fluid is contained in the ventricles, or between the brain and its membranes. This distinction is generally adopted: its correctness, however, is doubted by Dr. Duncan, jun. In many cases of chronic internal hydrocephalus, the ventricles, he observes, are so much distended, and the parietes so much thinned, that the head becomes translucent as a hydrocele, and the hemispheres form a mere membranous bag, which is generally ruptured in opening the head. The water is then supposed to be in direct contact with the membranes, and between them and the brain; the remaining parts of the basis of which are supposed to be the whole brain compressed by the water external to it, while the thinned upper portions of the hemispheres are altogether overlooked, or supposed to be an exudation of coagulable lymph.—(*Edin. Med. Chir. Trans.*, vol. i., p. 221.) That such mistakes may have happened, seems, indeed, highly probable, though authorities are so numerous and weighty in support of the reality of external hydrocephalus, that its existence can hardly be disputed.]

We have already observed that the substance of the brain has more generally evinced proofs of inflammation and other mischief than the membranes; though not unfrequently the increased vascularity and turgescence have extended from the parenchyma to the surface. As the existence of effused fluid is not necessary to the disease, it varies considerably in quantity when it is found, from a few drachms to eight or ten ounces or more; as a mean measure, however, it may be stated at five or six ounces. Most modern pathologists concur with Malpighi and Haller in holding that it is incoagulable; but Pechlin, Lapeyronie, and a few authorities of the present day, have denied this. [Dr. Abercrombie describes it as sometimes limpid, sometimes bloody, and sometimes turbid, containing shreds of flaky matter. In certain cases it is seen in the ventricles, exhibiting all the sensible qualities of pus. Generally, however, it seems to contain but a very small proportion of animal matter; and, in Dr. Marcet's experiments, a thousand grains yielded less than two grains of animal matter. In other cases, however, it is coagulable.] The disease is often connected with a scrofulous habit, and has sometimes formed a fatal metastasis to phthisis. [From the investigations of Dr. Mills, it appears that the disease often attacks the healthy children of healthy parents, but occurs more frequently in the puny or scrofulous, or in children whose parents are scrofulous, debilitated, or worn out by intemperance. There were appearances of scrofula in twenty-two of the patients examined by him. In two, the brain was scrofulous; in three, the lungs; in four, the liver; in eight, the mesenteric glands; in four, the spleen; and, in five, the cervical glands. Of the patients who recovered, six had no visible marks of scrofula, and the parents of twenty-six seemed also free from it.]

The mode of practice, in consequence of the above discrepance of opinion, has been extremely undecided: while many practitioners are so despondent as to fear that every plan is equally unavailing. It has fallen to the author's lot, however, to see several patients recover, both in infancy and verging towards adult age, who had all the characteristics of the disease, and were unquestionably labouring under it.

[This is a point on which the sentiments of Dr. Abercrombie differ from those of the author of the present work. The former admits that many cases have recovered which exhibited all the usual symptoms of hydrocephalus. Yet, if certain principles which he has endeavoured to establish be correct, and which have been already noticed in the foregoing pages, there is no certain test of effusion in the brain; and all the symptoms usually attending it exist in connexion with an inflammatory condition of the brain; which, if allowed to go on, would probably lead to effusion, but which, if treated with decision in its early stage, may be treated with success. Whether the fluid can be absorbed, or the disease cured after effusion, must remain a conjecture; but from the facts that Dr. Abercrombie has adduced, he inclines to the belief, that in ordinary cases, the removal of the fluid, if it were to take place, would be no improvement of the patient, because there would still remain the deep-seated disease of the central parts of the brain which accompanies the effusion in a large proportion of cases, and which, we have seen, may be fatal without any effu-

sion, yet with all the usual symptoms of hydrocephalus. It is a valuable observation made by Dr. Abercrombie (p. 149), that the ground of prognosis in particular cases, depends, perhaps, in a great measure, upon the activity of the symptoms. The more they approach the character of active inflammation, the greater the prospect of cutting them short; and the more they partake of the characters of low scrofulous inflammation, the less it will be. In every instance, the period for active practice is short, the irremediable mischief being probably done at an early period of the disease.]

Contemplating it as a variety of cephalitis, the author has uniformly pursued the general plan recommended under the preceding variety, and to this practice he can only ascribe whatever degree of success he has been fortunate enough to meet with.

Blood should be drawn freely from the nape of the neck by cupping or leeches: the head should be shaven, and napkins dipped in ice-water, or vinegar and water, be applied to the posterior part of it, and be changed every hour or half hour. The bowels should be freely purged with calomel, or calomel and jalap:* and the jalap should be toasted to render it less disposed to excite sickness: an easy diapnoë should, if possible, be excited and maintained on the skin; the chamber should be large and well ventilated: and, whenever it may be right to stimulate the head, epithems of neutralized ammonia should be preferred to blistering. The value of digitalis is doubtful; when used early it has seemed serviceable, but it should be avoided in the second stage of the disease; unless, indeed, it be employed, as by Dr. Gölis, to smooth the passage to death, by diminishing the violence of the convulsions that usually precede it. In later life than infancy, where it has been necessary to draw blood repeatedly, I have occasionally prescribed opening the temporal artery with great success: for a small quantity, as six or eight ounces of blood drawn in this way, will often answer the purpose of double or treble the quantity abstracted from the arm. In a young lady of nineteen, labouring under very prominent symptoms of this disease, I found the violent and deep-seated pain in the head cease instantly; and the pulse sink from seventy to forty-four, as soon as only a teacupful of blood had been taken away in this manner.

Mercury, employed both externally and internally, in a quantity sufficient to excite a pytalism, has also been used in many instances with great success, both among adults and infants, but particularly among the latter. Dr. Percival gives the history of a child of his own, aged three years and a quarter, in which a perfect cure was obtained by this and nothing else. In forty-eight hours signs of amendment appeared, and in six days the child was well; during which time thirteen grains of calomel had been taken, and seven scruples of strong mercurial ointment had been rubbed into the legs. Dr. Dobson of Liverpool employed quicksilver in the same double plan, and asserts that he found it equally useful, and most strikingly so in the following case. Four children of the same family had evinced this disorder in succession; three had fallen victims to it under a different treatment: one, between three and four years old, was subjected to the mercurial plan of calomel and inunction. In forty-eight hours a ptyalism was excited, the symptoms abated, and the child recovered.—(*Edin. Med. Com.*, vol. vi., p. 224.) Dr. Gölis prefers the internal to the external use of mercury, as far more active and to be depended upon. He gives it in free doses, and observes, "that an infant of a year old and under will bear a much larger proportion without diarrhœa or griping, than those of four, five, six, or even eight years of age." And hence to the former he often prescribes eight or ten grains in the course of twenty-four hours. If diarrhœa or griping be produced, it should be remitted. With Gölis, ptyalism has proved a rare effect.

In adults, the ordinary proportion is ten grains of calomel, and a drachm of strong mercurial ointment every night. Under this treatment, various cases of success are recorded in the Edinburgh Medical Journal.

[After depletion, Dr. Mills exhibits calomel with opium, but at first in small doses; and recommends blisters, or the antimonial ointment, to be applied to the head or its vicinity. He has also given nauseating doses of tartar emetic with decided benefit.]

SPECIES II.

EMPRESMA OTITIS.

EARACHE. IMPOSTEME IN THE EAR.

SEVERE PAIN IN THE EAR; TENDERNESS UPON PRESSURE; DEAFNESS, OR CONFUSION OF SOUNDS.

This is usually a distressing rather than a dangerous disease; but the fever is sometimes violent, and delirium, and even death has been a consequence. It is often produced by cold, and is hence frequently a local catarrh:* and is still more commonly, perhaps, occasioned by some exotic substance which has accidentally entered into the ear, as a small piece of ragged bone (*Hagendorn*, cent. i., obs. 64), a cherry-stone (*Fabric. Hildan.*, cent. iii., obs. 4), a worm, an insect, or the larva of an insect, as of an ant, a fly, or a cricket; of all which we have a variety of curious histories in medical journals.—(*Stalpart Van der Wiel. Maget. Journ. de Med.*, tom. lxiv.; *Mochring*, obs. 21; *Samml. Medicinischen Wahrnehmungen*, b. viii., p. 37.) In these instances, the disease is confined to the external ear: but from many of the ordinary sources of inflammation, it often exists within the tympanal cavity; whence, too, the inflammatory action has extended to the brain,

* Statement of the early symptoms which lead to the disease termed Water on the Brain. By G. D. Yates, M. D., 8vo., 1823.

* It often ensues after severe cases of scarlatina, measles, and some other diseases.—D.

or affected it by sympathy.* In this case, the membranes and lining of the inner organ are coated with coagulable lymph, pus, or both; while even the temporal bone of the affected side has become carious. An instance of this last kind is related by Dr. Powell. The patient was a young gentleman of sixteen, who had been attacked with otitis once or twice before. The pain was intense, but the pulse never exceeded seventy-two: yet the disease proved fatal. The intellect was at no time disturbed.†

The disease, therefore, offers two distinct modifications, and is so far correctly arranged by M. Itard.

α Externa. External Imposteme.	External ear highly irritable, lining membrane, when examined by a bright light, red and tumid.
β Interna. Internal Imposteme.	Hemicrania, sense of weight in the head: roughness about the mouth of the Eustachian tube: tonsils often enlarged.

A hissing or tingling sound accompanies both varieties; but is most painful in the latter. M. Itard‡ believes both to proceed chiefly from cold, and to possess much of the nature of a catarrh: but in dividing them into two distinct sub-species, a catarrhal and purulent, he ramifies very unnecessarily; for, let the exciting cause be what it may, the purulent is only a subsequent state to the preceding.

The EXTERNAL OTITIS generally suppurates in a short time, and then more completely forms what is vulgarly called an IMPOSTEME or IMPOSTHUME in the head, a term corrupted from *aposteme*; the discharge, which is usually yellowish, puriform, fetid, and somewhat bloody, flows from the external auditory passage in a greater or less abundance, according to the extent of the inflammation. It commonly diminishes in about a fortnight or three weeks; when the fluid becomes thicker, and to the eye, and even the smell, caseous. It then ceases, and is succeeded by a copious ceruminous secretion, which passes off without any injury to the sense of hearing.

This is the ordinary course; but it sometimes runs into a chronic state, and especially where there is a morbid diathesis from struma, syphilis, or variola; and, under such circumstances, it becomes often tedious and unmanageable, and is accompanied with a thickening of the tympanal membrane, and an obtuseness of hearing. In some cases, however, the *otorrhœa* or chronic state takes the lead. This is mostly the effect of cold, and is, in fact, an otitic catarrh. The discharge from the ear is at first, perhaps, not attended to, and, from particular circumstances, occasionally ceases for a time; but only to show itself in any accidental excitement with renewed violence. The discharge differs in different individuals in its consistence, colour, and the peculiarity of its smell, though the last is always offensive; it is at first mucous, then purulent, and at length consists of a thin sanies; in which last case, connected with the specific fetor that issues from a carious bone, there can be little difficulty in determining that some of the small bones of the ear, or even the temporal bone itself, are affected; which, indeed, are at times thrown out in minute fragments. M. Lallemand, who has ably treated upon this subject, observes, that "the morbid secretion is apt to alternate with attacks of rheumatism in other organs, catarrhus vesicæ, leucorrhœa, and various other complaints."* The most dangerous metastasis is that to the membranes or substance of the brain; which M. Lallemand conceives occasionally produces death so soon, that no trace of such a transfer is to be ascertained on dissection.

The general remedies for inflammation are here to be resorted to; and particularly warm, narcotic fomentations, and a dry atmosphere. Blisters behind the ears have often afforded relief; and for the same reason stimulant errhines and sialagogues: which, by evacuating the mucous follicles of the Schneiderian membrane, and the salivary glands, produce an influence on all the neighbouring parts, and often on the whole of the vessels of the head. And hence headaches, ophthalmias, and pains in the ear, are in many instances equally relieved by these applications, and were often employed by Dr. Cullen for this purpose.—(*Mat. Med.*, vol. i., p. 436–442.) When the case is chronic, setons or some other protracted drain should never be neglected.

When worms or larvæ of insects are the irritating cause, a few drops of oil of almonds introduced into the ear will readily suffocate them.

The INTERNAL OTITIS inflammation or imposteme of the tympanal cavity, may commence either in the lining membrane, or in the membranes which cover and connect the minute bones, or even in the mastoid cells; it is soon, however, apt to spread from its primary seat to

* Case of Inflammation and Abscess of the Brain, attended with Disease of the Ear. By John O'Brien, M. D., Trans. King's and Queen's Coll., Dublin, vol. ii., p. 309, 8vo., 1824; Parkinson, in London Med. Repository, March, 1817.

† Med. Trans., vol. v., art. xvi., p. 212.—The frequent connexion of inflammation of the dura mater with affections of the ear, and of the petrous portion of the temporal bone, has been of late admirably illustrated by Dr. Abercrombie.—See his Pathological and Practical Researches on Diseases of the Brain, p. 32, &c., 8vo., Edin., 1828. In the Museum of the University of London is a temporal bone, in the petrous portion of which an abscess formed, and the matter from which, after perforating the diseased bone, extended itself gradually down in the loose cellular membrane of the neck to the upper part of the chest. The disease proved fatal by bringing on inflammatory mischief in the neighbouring part of the dura mater.—ED.

‡ Traité des Mal. de l'Oreille et de l'Audition. Par J. M. G. Itard, M. D., &c., 2 tom., Paris, 1821.

* Recherches Anatomico-pathologiques sur l'Encéphale et ses Dependances Lettre quatrième 8vo., Paris, 1823.

every adjoining part, so as to implicate every division or recess of the cavity of the tympanum; and, unless the inflammatory action is soon mastered,* suppuration must necessarily ensue, and it rarely happens that the tympanal bones are not involved in this severer process. In some cases in which their articulations or other connecting mediums are destroyed, they drop away as soon as the tympanal membrane becomes so far ulcerated as to allow them a passage. Occasionally, however, a kind of adhesive inflammation, either between the articulating membranes, or the bones where the former are destroyed, may effect an anchylosis, and render them quite immoveable.†

How far, under these circumstances, the organ of hearing may be destroyed, must depend upon the extent of the disease, and the parts that have been actually involved in it. If that portion of the organization which merely assists in conveying the sound has been alone affected, the hearing will not necessarily or altogether be destroyed; and hence the malleus and incus, or two outer bones, are sometimes lost, while the sense of hearing is still preserved in a sufficient degree of perfection for ordinary purposes; the sonorous vibrations being afterward conveyed through the tympanum, as usual, along its parietes to the stapes, and by the vestibular fenestra to the labyrinth. But if these last have participated in the ulcerative process, and especially if the stapes be detached with the other bones, the vestibule laid open, the sac eroded, and the water which it contains have escaped, the destruction has extended to the sentient, as well as to the conveying part of the general organ, and the loss of hearing will be irreparable on the side on which the mischief has occurred. —(*Edin. Med. and Surg. Journ.*, No. lxxiv., p. 92.)

* The means recommended by Dr. Burne (Cyclop. of Pract. Medicine, art. Otalgia and Otitis), are one general bleeding, to the extent of from ten to twenty ounces; the repeated and free use of leeches; blistering the nape of the neck, and an active purge with calomel, jalap, &c., followed up by the exhibition of one or two grains of calomel, and a quarter of a grain of tartarized antimony, every two hours through the first day, and every three or four hours during the second, after which the antimony is omitted, and the calomel continued according to circumstances. If suppuration occur, fomentations and poultices are to be employed, and ammonia and opium prescribed. There may be cases, in which the confined state of the matter will require the membrana tympani to be punctured.—Ed.

† Of the five openings leading to and from the tympanum three are closed, the fenestra ovalis and fenestra rotunda by their proper membranes, and the large opening to the external meatus by the membrana tympani; while the other two are open, the one leading to the Eustachian tube, the other to the mastoid cells, which cells, forming a cul-de-sac, leave the Eustachian tube the only open channel of communication with the tympanum from without. Hence, in inflammation of this cavity, it and the mastoid cells become filled with the usual product of inflammation of a mucous membrane, which has no means of escape, because the Eustachian tube itself is generally involved in the inflammation, and closed. In this manner the delicate texture of the ear is exposed to the pressure and other bad effects resulting from the confinement of matter; and hence arise ulcerative perforation of the membrana tympani, puriform discharge from the meatus externus, destruction of the organ by caries, and eventually cerebral abscess, and death.—See art. Otitis, by Dr. Burne, in Cyclop. of Pract. Med.—Ed.

SPECIES III.

EMPRESMA PAROTITIS.

MUMPS.

PAINFUL UNSUPPURATIVE TUMOUR OF THE PAROTID GLANDS, OFTEN EXTENDING TO THE MAXILLARY; CONSPICUOUS EXTERNALLY; FREQUENTLY ACCOMPANIED WITH SWELLING OF THE TESTES IN MALES, AND OF THE BREASTS IN FEMALES.

The parotid glands are subject to a troublesome, and sometimes a fatal phlegmon, which we have already noticed under the name of phlegmone *parotidea*. The inflammation before us is altogether of a different kind; it is more extensive, more painful, and rarely tends to suppuration. In our own country it is vernacularly called mumps, in Scotland branks, and in France oreillons, and ourles.

The tumour, though sometimes confined to one side of the neck, more usually appears on both; it is at first moveable, but soon becomes diffused to a considerable extent. It increases till the fourth day, and often involves the maxillary glands in the inflammation; is evidently contagious, and often epidemic. After the fourth day, it gradually declines; and, for the most part, there is but little pyrexy, or need for medical aid; a brisk purgative or two, and avoidance of cold, being all that is called for.* The sympathetic action of the testes and the mammæ is most conspicuous towards the decline of the inflammation. And, in many instances, it is by no means an unfavourable sign; for it has been occasionally found, that where sympathy has not been manifested, or the glandular swelling has been suddenly repelled,† the symptomatic fever has been greatly exacerbated, delirium has ensued, and even death has closed the scene.

* The patient's diet should not be stimulating, and exposure to cold ought to be avoided. The common plan of covering the swelling with flannel, sprinkled with hartshorn, or camphorated spirit, is by no means a bad one. Parotitis, in a subacute form, occasionally takes place on the decline of fevers, or follows exanthematous diseases, as measles, smallpox, and scarlet fever, or occurs as an effect of scrofula. It is only in the form of *mumps* that the disease is supposed to be contagious.—Ed.

† In consequence of the well-known fact, that the inflammation in parotitis is strongly disposed to a metastasis from its original seat to other organs, cold applications should be avoided, and this not only with respect to the swelling of the parotid gland itself, but to any secondary inflammations in the breast or testicles. Leeches and warm poultices and fomentations may be safely employed, when the degree of inflammation requires them.—Ed.

When there is any danger of such a result, the swelling should, if possible, be brought back, or sustained by stimulant cataplasms or blisters. Dr. Hamilton has in several cases observed this sympathetic influence operating alternately; and mentions more than one instance, in which, after a very considerable enlargement of the testicle, upon the cessation of the disease, this organ entirely wasted away, insomuch that the tunica vaginalis became an empty bag.*

In advanced life, parotitis is sometimes apt to run into a chronic form, accompanied with very mischievous symptoms; in which state it is denominated a malignant parotid. This is more especially apt to take place in females when menstruation is on the point of ceasing, and the general action of the system labours under some disturbance. The tumour should, if possible, be dispersed by leeches and cooling repellants: for if it proceeds to suppuration, to which it tends, though very slowly, the ulcer rarely heals; usually degenerating into a foul offensive sore, that sinks deeper and spreads wider, resisting all medical treatment, and at length undermines the constitution, and destroys the patient. Vomits frequently repeated, have in this case been found highly serviceable; and those of the antimonial preparations are to be preferred to ipecacuanha. They maintain a longer action, and determine more effectually to the surface, or rather to the excernents generally. [Dr. Neumann, of Neustadtel in Silesia, employed the hydriodate of potass with great success as an external application in empresma parotitis, which prevailed epidemically in that town in June, 1823. Among the poor classes, who were treated in the ordinary way, the disease was very tedious, and generally ended in suppuration. Among the higher ranks, the treatment consisted in the exhibition of an emetic, and covering the tumour with a plaster, composed of eight parts of mercurial ointment, and one part of the hydriodate of potass; and the common result was a complete cure in three or four days. In the cases so treated, Dr. Neumann never observed any metastasis to other organs, and he is disposed to impute this to an erythematic redness, which always appeared on the first or second day, and remained from eight to twelve days.†] In a case in which a diseased condition of the parotid gland formed only part of an enormous tumour in a patient aged forty, Mr. Carmichael removed the whole by the knife, and the patient recovered, with a slight partial paralysis of one of the muscles on the affected side.* [The parotid gland, when affected with cancer or sarcoma, has also been successfully removed by Béclard, Lisfranc, Professor Naegele of Heidelberg, and others.† When, however, the whole of the gland is diseased, its deep extension at the base of the scull makes the removal of every portion of it impracticable. In one example, in which the disease created a serious impediment to deglutition, and had made such progress that the effectual removal of the whole of it seemed impossible, Dr. Fricke of Hamburgh tied the carotid artery. The result was a partial diminution of the tumour, and an improvement in the power of swallowing; but abscesses afterward formed in the swelling, and the patient fell a victim to constitutional disturbance.]

* Edin. Trans., 1773. Numerous individuals pass through life without even having had parotitis, while a few have it oftener than once. It is most frequent in children, in whom it is often regarded as a sign of their being about to shoot up in their growth. The hypothesis that strumous children are more liable to it than others, does not agree with the editor's observations. Sometimes it is endemic in schools, particular towns or villages, public institutions, ships, &c.—ED.

† See Rust's Mag. für die Gesammte Heilkunde, 1826; and Edinburgh Medical Journal, No. xciii., p. 452.

SPECIES IV.

EMPRESMA PARISTHMITIS.

QUINSY.

REDNESS AND SWELLING OF THE FAUCES; WITH PAINFUL AND IMPEDED DEGLUTITION.

THIS is the squinsy or squinancy of our old writers; the cynanche or angina of medical books. Paristhmia, from παρὰ and ἰσθμὸς, literally *morbus fauchum*, or *throat-affection*, is the term employed by Hippocrates, and is only varied to paristhmitis, in the present system, in consonance with the general termination of all the species belonging to the genus before us. The term was used among the Greeks, as on the present occasion, in a specific sense; though the later Greek physicians gave different names to its different varieties; and hence we meet with cynanche, synanche, and parasynanche; the common signification of all which is *angina* or strangulation, while the prefixes cy- sy- and parasy- are of doubtful meaning, as I have further observed in the preliminary dissertation to the Nosology. Aëtius attempted to justify *cynanche*, but Cœlius Aurelianus and Paulus used *synanche*, after Celsus. The Latins employed angina in the same extent as Hippocrates did paristhmia; quinsy is used in a parallel latitude among ourselves. Sauvages conjectures, and there is some ground for the opinion, that the synanche of the Greeks was the *common* quinsy of the present day, the *paristhmitis tonsillaris* of the system before us; their parasynanche, the quinsy of the pharynx, *paristhmitis pharyngea*; and their cynanche, croup, or *empresma bronchlemmitis*.

* Trans. of the King's and Queen's College, Dublin, vol. ii., p. 101, 8vo., 1824.

† As early as 1808, Dr. Samuel White, of Hudson, N. Y., published an account of his extirpation of the parotid gland. Béclard's operation was performed in 1823. Cases of the same have been recorded by Dr. McLellan of Philadelphia, Dr. Mott of New-York, Dr. Bushe, and others. See a Dictionary of Practical Surgery, by S. Cooper, with numerous notes and additions, by David M. Reese, M. D., published by Harper and Brothers, New-York, 1834.—D.

Quinsy presents itself to us under four varieties: the common inflammatory sore throat; the ulcerated, or malignant; the sore throat that peculiarly attacks the pharynx; and inflammation of the œsophagus.

α Tonsillaris. Common Quinsy. Inflammatory sore throat.	Swelling of the mucous membrane of the fauces, and especially of the tonsils; redness florid; fever a cauma.
β Maligna. Ulcerated, or Malignant sore throat.	Redness crimson; with ulcerations covered with mucous and spreading sloughs, of an ash or whitish hue; fever a typhus. Frequently epidemic, generally contagious. Found often as a symptom in rosalia, or scarlet fever.
γ Pharyngéa. Pharyngic quinsy.	Redness florid, and especially at the lower part of the fauces; deglutition extremely painful and difficult; fever a cauma.
δ Œsophagi. Quinsy of the œsophagus.	The impediment to deglutition felt below the pharynx, with a circumscribed pain, and rejection of food when it reaches the seat of obstruction.

In the FIRST VARIETY, or COMMON QUINSY, the swallowing is, for the most part, greatly impeded; and the speech, and sometimes even the respiration, rendered highly troublesome; the mucus is excreted sparingly, and consequently there is a considerable clamminess in the mouth; and the pain sometimes spreads to the ears. The disease is never contagious, and, though violent while it lasts, is comparatively of short duration. It terminates by resolution or suppuration, hardly ever by gangrene; though a few sloughy spots sometimes appear upon the fauces.

The usual cause is cold; and it is hence found most frequently in spring and autumn, when vicissitudes of heat and cold are most common. It is supposed to affect particularly the young and the sanguine: but, in my own practice, it has occurred as often at other ages and in other temperaments. When it has been reproduced several times within short intervals of each other, it is apt to establish a peculiar diathesis or habit, so as to be excited readily, and by very slight occasional causes.

If attacked by a medical process early, much benefit has been derived from astringent and acid gargles, and vapours inhaled by any simple machine for this purpose.* Blisters to the throat, or behind the ear, ought also to form a part of the curative plan; and, if bleeding be had recourse to, it should be by scarification, or leeches applied to the tonsils or fauces. An early use of leeches I have often found highly successful, and can distinctly corroborate Dr. Crampton's remark, that leeches fix far more readily on moist internal surfaces than on the skin. Dr. Crampton, by way of caution, passes a thread of silk through the lower half of the body of the leech (*Dublin Hospital Reports*, vol. iii., p. 229), but I have never found this necessary. Cooling purgatives, and a low regimen, should also enter into the general plan of treatment. If suppuration cannot hereby be prevented, the better way will be to expedite this termination by the steam of warm water, or water impregnated with the leaves of rosemary or chamomile; and, where the fluctuation is clear to the touch, if the abscess do not of its own accord break readily, it ought by all means to be opened with the lancet.

In a few instances the suppuration has pointed and broken externally, and the termination has been favourable.—(*Schenck*, lib. ii., obs. 36.) And occasionally, from the extent and violence of the inflammation, there has been so much danger of suffocation that it has been found necessary to make an opening into the trachea (*Ballonius*, i., p. 182; *Fernire*, *Journ. de Méd.*, tom. lxii.): which has been done sometimes as high as the larynx, and sometimes considerably lower; and, under both kinds of operation, the patient has recovered.—(*Fienus*, *Chir. Tract.*, iv., v., c. 1; *Musgrave*, *Phil. Transact.*, No. 258.)

In the MALIGNANT or SECOND VARIETY, the inflammation passes at once into the ulcerative stage, and is consequently characterized by the symptoms stated in the definition: the sloughing often takes place rapidly, and spreads widely, and the fever is a typhus. This variety is frequently epidemic, generally contagious, and found often as an alarming symptom in rosalia, or scarlet fever. In its idiopathic form it is usually ushered in with a sense of stiffness in the neck, accompanied with some hoarseness of the voice, and occasionally with symptoms of a coryza. It is in effect a quinsy taking an erythematic or erysipelatous, instead of a phlegmonous turn, in consequence of the peculiar temperament of the atmosphere, or of the patient, or of some unknown cause.

The sloughs at first appear whitish or cinereous, but soon become brown and often black, and spread over the whole of the fauces and mouth, into the nostrils, and often down the œsophagus; the ulceration has, also, sometimes passed up the Eustachian tubes, and affected the ears. And, as the sloughs appear to carry contagion with them, on being swallowed they have communicated the disease through the entire range of the alimentary canal.

The danger is hence very great if the ulceration cannot be checked, and it is peculiarly so

* One of the best local applications in the early stage of this form of paristhmitis is the nitrate of silver, a strong solution of which should be applied with a camel's hair pencil, to the inflamed tonsil and the parts adjacent. A more active treatment than that proposed by Dr. Good, will, however, often be required in these cases, and then our most prominent remedy is general bloodletting. We have employed also, with advantage, scarification of the tonsils, as recommended by Dr. Kopp, of Hanau.—D.

to children and adults of relaxed and delicate frames. The disease makes its appearance most commonly in the autumn, though it has appeared in every season.

The erythematic character is sometimes very striking, the intumescence spreading widely, yet limiting itself to the cellular tissue. Even externally the throat is swollen, hard, and tender; while such is the constriction within, that deglutition is impossible, and there is great danger of suffocation. Dr. G. Gregory has given a well-marked instance of this modification in a young woman in whom it terminated fatally on the sixth day, and has referred to other cases of a similar kind, and mostly with a similar result, from Dr. Kirkland, Dr. Wells, and Mr. James. From its being chiefly seated in the cellular membrane, Dr. Gregory has given it the name of *cynanche cellularis*.—(*Med. and Phys. Journ.*, vol. xlviii., p. 287.)

Dr. Cullen regards the eruption of scarlet fever as a pathognomonic symptom of this disease: but this is to confound two complaints that are very clearly distinct, as we shall have further occasion to observe, when discussing rosalia, or scarlet fever. It is at present sufficient to remark that, even in the opinion of Dr. Cullen himself, quinsy is not essential to scarlet fever, or, in other words, does not always accompany it; and that, on the other hand, a scarlet eruption is not essential to the malignant quinsy, or does not always accompany it, though he contends that it does almost always.—(*Practice of Physic*, part i., book iii., chap. iv., sect. dcli.)

The malignant or ulcerated sore throat may be without a scarlet eruption, or with it; if the former, it is an idiopathic affection, and constitutes a variety of paristhmitis or cynanche. If the latter, it is a symptomatic affection, and constitutes a variety of rosalia or scarlatina.

Cleanliness, pure air, and a free ventilation, are here of the utmost importance; and, as the contagion is often very active, the nurses should be cautious to remove speedily the sloughs and foul mucus that are washed or wiped from the month.

The general treatment will necessarily be the same as that we have already pointed out for typhus. Emetics are often employed with great advantage at the commencement of the complaint; and the bowels should be gently opened, but not irritated with drastic purges.

Here, also, as a means of abstracting blood locally, leeches have been often found of peculiar advantage when timely applied (See *Dr. Crampton, on the Application of Leeches to Internal Surfaces, Dubl. Rep.*, vol. iii.): and the throat should be soon afterward gargled with port wine made still more stimulant by spices or other aromatics; or with a strong decoction of bark, rhatany, or catechu, very sharply acidulated with mineral acids, the aromatic or pungent Cayenne vinegar, or charged with an addition of Cayenne pepper in substance. Gargles of the mineral, and even the metallic astringents, have also been tried, but, in general, they want poignancy. Lunar caustic, in the proportion of one part to a thousand parts of water, has sometimes been found useful (*Journ. de Méd.*, Nov., 1789), as has the tincture of capsicum with infusion of roses, in the proportion of an ounce of the former to seven or eight ounces of the latter.

A strong decoction of mezereon root may also advantageously form the basis of a gargle; though even this will be improved by an addition of capsicum or Cayenne pepper (*Collin. Med. Comment.*, ii. 27; *Stephen, Med. Comment.*, Edin., v.), or the aromatic or mineral acids. The stimulus of mezereon is less acrid than that of Cayenne pepper, but it is more permanent, and acts more immediately on the fauces. [Gargles, containing the chlorurets of lime and soda, have been particularly useful in the present disease.] In conjunction with these, camphire and ammonia have often been found beneficial, when externally applied in the form of a liniment.—(*Rumsey, Lond. Med. Journ.*, x.) Both may be used internally; and the latter will be found, as Dr. Peart has well observed (*Practical Information on the Malignant Sore Throat*, &c.), one of the best stimulants we can employ, in doses of half a scruple of the subcarbonate every three or four hours. Bark and wine should also be taken jointly, and in as large a quantity as the system will bear. Even sleep is less necessary than both these: nor should the patient be suffered to rest for a period of three hours at a time without fresh doses of both, though we wake him for the purpose. Time, indeed, is here every thing: if we make no progress in the first thirty-six hours, we may tremble for the event. Women, unaccustomed to wine, have taken it successfully under this disease, in the proportion of two bottles a day, for more than a fortnight.*

* The therapeutical indications in the malignant form of paristhmitis, as stated by American physicians, vary much. Many rely principally on the employment of powerful stimulants externally and internally; with others, the application of leeches near the part affected, and sometimes general bloodletting, are considered expedient. No remark from us is necessary as to the utility of blisters, and other counter-irritants, which should be applied early. The utility of lunar caustic, but in a solution much stronger than that prescribed by Dr. Good, and gargles made with the chlorurets of lime and soda, and with diluted pyroligneous acid, have found strong advocates with us. A century ago, mercurial remedies were recommended in the treatment of the malignant throat distemper, by Dr. Wm. Douglass, of Boston. This author's description of the disorder, as it prevailed epidemically in several parts of New-England, in 1735-6, contains conclusive testimony as to its formidable character, and mercury was used on the principle "similia similibus curantur," or, to quote his own words, "as any affection of the throat does frequently produce a natural ptyalism, mercurials, used with discretion, are a kind of specific in such like ulcers and ulcuscula; among all mercurial preparations, calomel answered best; turbith proves generally too strong a revulsion."—(Pract. Hist. of a new Epid. Eruptive Miliary Fever, &c., Boston, 1736; and N. E. Journ. of Med. and Surg., vol. xv., p. 1.) So

Quinsy of the pharynx is, properly speaking, that which commences in this organ. It is met with but rarely; nor is it, when it does occur, a case of serious importance. It is distinguished by the florid redness of the inflammation, especially at the lower part of the fauces, and by the nature of the fever, which is a cauma. The pain, indeed, extends sometimes behind the sternum, but is only felt in swallowing. The breathing is not affected. A cure is easily induced by swallowing slowly nitrous and mucilaginous medicines, and taking off the phlogotic diathesis, where it prevails, by bleeding and brisk purgatives.

Quinsy of the œsophagus, the *cynanche œsophagitis* of Professor Frank (*De Cur. Hom. Morb. Epit.*, tom. ii., p. 104, 8vo., Mannh., 1792), is more deeply seated than the preceding, though the inflammatory blush often extends to the fauces. The food will in consequence pass forward to the seat of obstruction, but no further; and, by irritating the inflamed part, produces a painful effort to vomit, which continues till, by a severe struggle, which occasionally reaches to the back-bone, the ingulfed morsel is dislodged, and thrown back into the mouth.

M. Bretonneau, in a recent work of great value, has given instances in which the inflammation before us, instead of leading to ulceration, shows a tendency to the production of concrete and membranous exfoliations, precisely like those of croup; into which disease it occasionally passes by an extension of the inflammatory action from the fauces or tonsils to the glottis. To this modification he has given the name of *angina diphtheritica*, or croupal sore-throat: and wherever it exists its treatment is to be that of this last disease.—(*Des Inflammations Spéciales du Tissu Muqueux*, &c., *Par P. Bretonneau*, Paris, 8vo., 1826.)

SPECIES V.

EMPRESMA LARYNGITIS.

INFLAMMATION OF THE LARYNX.

PAIN ABOUT THE LARYNX; EPIGLOTTIS SWOLLEN AND ERECT; BREATHING SHRILL AND SUFFOCATIVE; GREAT ANXIETY; DEGLUTITION IMPEDED; FEVER A CAUMA.

It is doubtful whether this severe and dangerous complaint has ever been described till of late years. It seems to have been known to Dr. Mead, whose general account coincides with a disease noticed by Hippocrates. It is minutely and accurately detailed by Dr. Home, in his Principia; and is the subject of several excellent papers in the Transactions of the Medico-Chirurgical Society, particularly by Dr. Farre, Sir Gilbert Blane, Dr. Roberts, and Dr. E. Percival. It is particularly and accurately described by Professor Frank.—(Ut supra, tom. ii., p. 105.) The disease, as will be perceived by the definition, bears a considerable resemblance in many of its symptoms to croup; is highly acute, and destroys by suffocation in a day or two, unless very actively opposed. Frequently, indeed, it destroys much sooner.* Brassavoli mentions a case that proved fatal in ten hours (*Comment. ad Hippocr. de Rat. Vict. Acut.*, lib. iv.); and Schenck another, in which suffocation and instant death were produced by a fit of vomiting, the spasmodic action having extended to the stomach or its auxiliary muscles.—(*Obs.* 29, *ex Trincavellio*, lib. ii.) Of three cases described by Dr. Baillie, each proved fatal; two of them on the third day, and one on the fourth. The patients had all been previously subject to inflammation of the throat, and were between forty and sixty years of age. —(*Wardrop's edition of Baillie's Works*, vol. 2. p. 54.)

It is produced by cold or the usual causes of quinsy, but has been often excited by too much exertion of the organ in singing, or public speaking.

The disease makes its approach with the common symptoms of inflammatory fever, as chilliness succeeded by heat; the voice becomes hoarse and indistinct; the breathing laborious, with a painful sense of constriction in the throat; the fauces present a Modena-red colour, and are considerably swollen and turgid, the swelling extending to the face and eyes, the latter not unfrequently protruding, as in cases of strangling; though occasionally the inflammation is confined to the larynx, and no peculiar appearance is to be traced on the tonsils, uvula, or velum palati (See *Mr. Cockburn's Case*, *Edin. Med. and Surg. Journ.*, Apr., 1823); the pulse is quick, and the tongue furred; and every attempt to swallow is accompanied with great distress; the muscles of deglutition, and even those of the chest, being thrown into severe spasms, threatening the patient with instant death from suffocation, and making him call out for air and an opening of the windows.

It is distinguished from croup by the existence of a perpetual and voluntary hawking, rather than a forcible and involuntary cough, as though to clear the passage by expectoration. It is also distinguished from it by the nature of the expuition, which is a viscid mucus, rather

early as 1751–2, the late venerable Dr. Holyoke, of Salem (Mass.), informs us, that he was in the habit of prescribing mercurials. Dr. Ogden, of Jamaica (L. I.), in his letters on the malignant sore-throat distemper, dated Oct., 1769, and Sept. 14, 1774, warmly enjoined the mercurial practice; and he assures us, that he administered the mercurius dulcis freely in the sore-throat disease, both in children and adults, about twenty years before the date of his first publication. "Perhaps it is most safe to divide the merit of this bold and adventurous practice between Dr. Douglass and Dr. *Ogden*; the authority of the latter, however, had great weight in extending the mercurial treatment in sore-throat affection, and in other diseases of an acute nature."—(Thacher's Am. Med. Biography, life of Ogden.) It was deemed suitable in this place to substantiate the claims of American physicians to this novel method of practice, however bold it has been pronounced by some.—D.

* "I have seen it," says Armstrong (Lect. on the Morbid Anatomy, Nature, and Treatment of Acute Chronic Diseases, London, 1834, p. 268), "in one case terminate fatally in seven hours from its commencement; in another case it ran its course in eight hours."—D.

than a coagulable and membrane-like exudation. The two diseases differ, moreover, in their proximate causes as considerably as in their symptoms. Laryngitis consists in a *suppurative* inflammation of the membranes of the larynx, extending backward to the membrane common to itself and the œsophagus, between which pus is often found lodged; while croup or bronchlemmitis is a *peculiar* inflammation of the trachea, extending through the bronchial vessels, and exciting, on their internal surface, the secretion just noticed of a concrete filmy material, which threatens suffocation by filling up the opening of the rima glottidis. [How far this last statement agrees with the facts revealed by morbid anatomy, will be considered under the next species.*]

In the treatment of this distressing malady, our object should be to take off the inflammation by the most active means. For this purpose, eighteen ounces of blood should be instantly drawn from the arm, and eight or ten from the throat by leeches; and the bowels should be thoroughly purged by calomel and jalap, or some other active cathartic. In connexion with this process, many writers advise the application of blisters, and the use of relaxant inhalations. But, in preference to both, I would recommend gargles of ice-water acidulated, and epithems of pounded ice applied externally. Professor Frank recommends, as in bronchlemmitis, a free use of calomel, in the proportion of five grains at a dose to infants of two years old, two or three times a day, or three grains every three hours, till fifteen grains have been taken. If this plan do not speedily answer, no time is to be lost, and bronchotomy must be had recourse to. But whether the opening should be made in the larynx or below it, must be left to the judgment of the surgeon.

In a few instances, however, this disease seems to commence with comparatively little violence, and to run easily into a chronic form.

[A disease, well deserving of the name of chronic laryngitis, has been faithfully described by Mr. Lawrence. The patients died of suffocation; but the progress of the complaint was slower than in the more acute modification of the disease, noticed by Drs. Farre, Percival, and Baillie.—(See *Med. Chir. Trans.*, vols. iii. and iv., and *Trans., of a Soc. for the Imp. of Med. Knowl.*, vol. iii.) The symptoms were not acute, nor did the inspection of the parts disclose any marks of active inflammation. The membrane covering the chordæ vocales was thickened, so as to close the glottis; and a similar thickening extended to a small distance from these parts, accompanied with an œdematous effusion into the cellular substance under the membrane. The epiglottis did not partake of the disorder. In one or two instances, this thickened state of the membrane was the only change of structure observed; but in others, it was attended either with ulceration of the surface near the glottis, appearing as if it had been formed by an abscess which had burst; or with a partial death of one or more of the cartilages of the larynx; viz., the arytenoid, thyroid, or cricoid. The rest of the air-passages, and the lungs, were healthy. In most cases, Mr. Lawrence is an advocate for the early performance of bronchotomy.—(*Med.-Chir. Trans.*, vol. vi., p. 221, &c.) The prospect of success will of course very much depend upon the state of the lungs, and the disease being free from any other serious complication.]

In the *angina laryngea œdematosa* of M. G. L. Bayle, the expuition is glairy, rather than membranous. In the course of the chronic inflammation by which the disease is marked, and which produces the effusion, a few tubercles or caruncles are formed, that render inspiration suffocative, yet interfere but little with expiration. A cough, as may be expected, is sometimes a concomitant.

This form of inflammation has generally been found to take place in debilitated habits, or after

* The following passage from an article on laryngitis, written by Dr. Cheyne, merits attention:—"We acquire," says he, "a juster view of laryngitis, by contrasting that disease with croup. They are both truly inflammatory diseases, but in that point alone do they resemble each other. Croup is a disease occurring before puberty, generally affecting not merely the larynx, but the whole of the bronchial membrane; ending in an effusion of lymph on the free surface of the membrane; to be cured, probably, in ninety-nine cases of a hundred, by emetics and bleeding timely employed; and it is a disease in which a surgical operation will only add to the danger, to which, in its second stage, the patient is exposed. Laryngitis, on the other hand, is a disease which rarely occurs before puberty; is confined to the upper extremity of the windpipe; ends in a serous effusion into the cellular tissue beneath the mucous membrane; will probably terminate unfavourably, in a great majority of cases, under any method of treatment, in which emetics aggravate the danger, and bleeding is often a doubtful remedy, and in which, when the patient is *in extremis*, bronchotomy will afford the only reasonable hope of safety.—(Cyclop. of Pract. Med.) It seems questionable, however, whether this contrast may not, in one respect, go rather too far; for the editor, some time ago, presented a specimen of laryngitis to the London University, taken from a person who died of scarlet fever; and in this instance, there was a thick layer of lymph effused, not only on the lining of the larynx, but on that of the trachea. In the foregoing quotation, the facility of curing croup has probably been overrated. With respect to the doubtful good effects of bleeding in laryngitis, this observation seems to be intended only for particular cases, because Dr. Cheyne has adduced abundant proof of the benefit often derived from the free use of the lancet in this disorder. At the same time, he refers to instances in which bleeding had pernicious effects. We may, says he, with comparative safety, bleed while the complexion is good, or, in other words, as long as the quantity of atmospheric air admitted into the lungs is sufficient to produce that chymical change, by which venous blood, in passing from the right ventricle into the right auricle, is converted into arterial; but when the blood is no longer arterialized; when the face and lips become livid, the expression anxious, the eyes protruded and watery, Dr. Cheyne sets down bleeding as injurious. Under such circumstances, either laryngotomy or tracheotomy is indicated.—E.o.

an exhausting fever, or some other complaint. If the patient recover, it is usually in about three weeks: for the most part, however, no remedial plan succeeded at La Charité, and the disease terminated fatally in about a month or six weeks. Tracheotomy was often tried, but rarely with success. On dissection, some degree of ulceration, or purulent discharge, was commonly traced.—(*Mém. sur l'Œdème de la Glotte, ou Angine Laryngée Œdémateuse; Nouveau Journ. de Med.*, Janv., 1819.) It ought to be observed, that Dr. M. Hall, Mr. F. White (*Dublin Hospital Reports*, vol. iv., p. 561), Mr. Liston (*Edin. Med. and Surg. Journ.*, No. lxxvii., p. 568), and others, have since succeeded with tracheotomy in several instances in our own country. If the inflammatory action commence below the larynx, it is called *tracheitis* by Professor Frank (*De Cur. Hom. Morb.*, tom. ii., p. 107); yet the pain and struggle are here considerably less than in proper laryngitis, though they sometimes resemble the signs of sternalgia, or angina pectoris.*

* Several American writers have contributed to our knowledge of this affection, as Prof. James Jackson of Boston, Dr. Dick of Virginia, Drs. Bliss and Peixotto of New-York, &c. The most valuable monography is that by Dr. J. B. Beck, of New-York.—(N. Y. Med. and Phys. Journal, vol. iii., p. 397.) This author has traced the disease in the writings of Cœlius Aurelianus, Celsus, Tulpius, Riverius, Morgagni, Lommius, Boerhaave, and Lieutaud. Dr. Beck regards laryngitis as purely local in its origin, affecting males rather than females, probably on account of the greater development of the larynx in the former, and as generally attacking adults; in the few cases recorded of its occurrence among children, it has been caused by the application to the part of a powerful stimulus, as steam, &c. The disease of which General Washington died, is justly considered by Dr. Beck to have been laryngitis. In the treatment of this disorder, Dr. B. thinks the indications of cure are "first to arrest, if possible, the progress of inflammation, and thus prevent effusion; and if we should fail in this object, in the second place, by means of an artificial opening in the trachea, to enable the patient to breathe, until the obstructions in the larynx may be removed, either by the process of absorption or by the aid of medicine. Our means for accomplishing the first are bloodletting, emetics, cathartics, blisters, and mercury. The second requires the operation of tracheotomy." Bloodletting should be pursued freely, without regard to the absolute quantity which may be drawn, but to the effect produced on the system. This effect is syncope. Emetics relieve, not merely by their relaxing effects on the system, but by the copious secretions they produce from the mouth and fauces. Purgatives aid by lowering the general tone of the system. Blisters, to be useful, should be applied early, and to the chest, abdomen, or inside of the thighs. In regard to mercury, he says, "that after the use of depletion and emetics, there is no article within the knowledge of our art which can be trusted to, with such just confidence for accomplishing a cure, as calomel." Dr. Beck thinks it important that the operation of tracheotomy should not be deferred till the last stages of the disease, and till the patient is already sinking, and that it should be tried in all cases where other means have proved ineffectual.—D.

SPECIES VI.
EMPRESMA BRONCHLEMMITIS.
CROUP.

BREATHING PERMANENTLY LABORIOUS AND SUFFOCATIVE; SHORT DRY COUGH; EXPECTORATION CONCRETE AND MEMBRANOUS; FEVER A CAUMA.

In the first edition of the present work, as also in that of his volume on Nosology, the author was induced to follow M. Swediaur, Dr. Young, and various other authorities, in denominating this disease BRONCHITIS; but as the same term is used in a very different sense by various other writers, importing inflammation of the bronchiæ generally, though a sense hardly called for, as, except in the present instance, such affection is usually a symptom of catarrh, or some form of pneumonitis, he has been induced to change the name of bronchitis for that of BRONCHLEMMITIS, which, as importing MEMBRANOUS OF MEMBRANE-LIKE inflammation of the bronchiæ, from λέμμα, "a sheath or membrane," as in neurilemma, a sheath or membrane of the nerves, is expressly descriptive of that concrete or tubular effusion which peculiarly characterizes the complaint. In a valuable treatise published by M. Bretonneau, of Tours, since the second edition of the present work, it has been described under the name of *Diphtheritis*, from διφθέρα, pellis, exuvium.*

[According to Laennec, Ballonius, in 1576, made the first mention of the disease.† The best informed critics, however, now incline to the opinion, that croup was not unknown to physicians of more ancient times. The particular merit to which Ballonius may rightly aspire, is that of having first distinctly described the effusion of coagulable lymph, or the false membrane in the larynx and trachea.‡ Laennec himself admits, that we owe the first good description of croup to Ghisi.—(*Martin Ghisi, Lettere Mediche*, Cremona, 1749.) Dr. Home's "Inquiry," which, as Dr. Forbes observes, was the first systematic account of croup in this country, was published in 1765.]◊

* Des Inflammations spéciales du Tissu Muqueux, et en particulier de la Diphthérite, ou Inflammation pelliculaire, connue sous le nom de Croup, &c. Par. P. Bretonneau, médecin en chef de l'Hôpital de Tours., 8vo., Paris, 1826.

† A learned paper, entitled, "Observations tending to ascertain whether the ancients were acquainted with croup," may be seen in the Am. Journ. of Med. Science, vol. iii., p. 56. It is written by Dr. John R. Coxe, of Philadelphia, and its object is to prove that the disease was known to Hippocrates, Galen, and many other writers, who existed anterior to those referred to by Michaelis, Cheyne, &c.—D.

‡ Ballonii Op. Omn. Med., tom. i., p. 132. Venet., 1734. Also Rubini, Riflessioni sulla Malattia denominata Crup, p. 200; and Forbes's Trans. of Laennec on Diseases of the Chest, p. 118, note, 2d edit.

◊ For a complete bibliographical history of croup, Dr. Forbes refers to Michaelis, De Angina Polyposa, Argent., 1740. Rubini, Riflessioni sulla Malattia communemente denominata Crup, Parma, 1813; and Bretonneau, De la Diphthérite, ou Inflammation Pelliculaire, Paris, 1826. These au-

This disease appears in the present day to exist in most parts of the world, and in the American states is called *hives*, supposed by my distinguished friend Dr. Hosack to be a corruption of the term *heaves*, and probably so named from the heaving or violent efforts of the muscles of the chest and abdomen which take place in breathing during its course.

The writers on croup have given but one form of it, except what has been erroneously called spasmodic croup, a disease of a different kind, which has already been described under the name of LARYNGISMUS STRIDULUS. Properly speaking, however, there are two forms, an acute and chronic, under which the present species shows itself, and which may thus be distinguished as varieties:—

α Acuta. Acute croup.	Sense of suffocation keen, and constrictive; chiefly seated in the larynx; respiration sonorous; voice harsh; cough ringing; great restlessness; terminating in a few days.
β Chronica. Chronic croup. Bronchial polypus.	Sense of suffocation obtuse and heavy; chiefly seated in the chest; cough severe, but intermitting; lasting some weeks or months.

The disease, in both varieties, usually commences with the common symptoms of a cough or catarrh; but essentially consists in a peculiar inflammation, that spreads through different parts, or even the whole range, of the windpipe, from the larynx to the minutest ramifications of the bronchiæ. In this extensive sense the tube was called *bronchus* by the ancients; and I have hence preferred the term *bronchlemmitis* to that of *trachlemmitis*, or membranous inflammation of the trachea, as such a term would imply a limitation of the inflammatory action to the upper part of the bronchus alone, to which it is not confined in either of the forms before us.

The FIRST VARIETY, importing the COMMON or ACUTE CROUP, the suffocatio stridula of Dr. Home, though it extends thus widely, usually commences in the larger parts of the tube; during which a peculiar effusion is secreted, that readily assumes a membranous form,* and sometimes lines, not only the trachea above its bifurcation, but also its minutest branches, though the larger parts of the tube are first affected. When chymically examined, the secretion appears to consist chiefly, if not entirely, of the gluten, or coagulable lymph of the blood, diluted with its serosity, and copiously combined with that peculiar substance of the blood, detected by the labours of modern chymistry, which, from its essential tendency to concrete into a fibrous, and even a membranous texture, has received the name of fibrin.

By what means the mucous secernents throw forth this peculiar effusion in the present disease, we know not. It is said by some writers to be secreted on no other occasion, and by no other organ; but this is unquestionably a mistake. There are few practitioners, perhaps, of accurate observation, who have not found it discharged at times from the intestinal canal; of which I have already given examples under DIARRHŒA *tubularis*; in which, as in croup, there is an inflammatory affection of the morbid organ, and a spasmodic constriction of the passage.*

[Croup, says Professor Laennec, is an inflammation of the mucous membrane of the air-passages, with exudation of coagulable lymph, which, becoming concrete at the very moment of its formation, lines the inner surface of this membrane to a greater or less extent. When this false membrane is removed, the subjacent tunic is found of a deep vivid red colour, occasionally livid and somewhat thickened. This colour is commonly very uniform over the whole space, covered by the false membrane, but is also not unfrequently unequal, and occasionally is even altogether wanting.—(*Hufeland's Journ.*, b. vi., p. 559.) In the greater number of cases, the degree of redness and swelling is less, than in many instances of dry catarrh. We cannot, therefore, attribute the plasticity of the secretion in croup, the distinctive feature between it and the mucous catarrh, simply to a higher degree of inflammation; but rather to the peculiar nature of that inflammation. The false membrane corresponds exactly to the form of the canals which it invests. Its thickness is usually somewhat greater in the larynx and trachea than in the bronchiæ, and varies from less than half a line to a line. Its consistence is about that of boiled white of egg; but this generally diminishes towards its extremities. It is of a white colour, sometimes with a shade of yellow, and is almost entirely opaque.

Some days, or even hours, after its formation, it begins gradually to be detached from the mucous coat, to which it had been closely adherent, and, after being broken into fragments by the cough, is sometimes expectorated. The separation is effected by a more liquid secretion, which, becoming in its turn also concrete, constitutes a second false membrane. This process may be repeated several times in succession; but, in general, each successive formation

thors prove, by extracts, that the croup was known to several ancient physicians, particularly Hippocrates and Aretæus; although its precise anatomical characters were not so, owing to the imperfect state of pathological anatomy.—See Laennec on Diseases of the Chest, &c., trans. by Forbes, note, p. 118, 2d edit.—ED.

* An excellent plate of this membranous formation, resembling a morbid specimen in the cabinet of Dr. J. W. Francis, of New-York, may be seen in the Am. Med. and Phil. Reg., vol. ii., p. 41.—D.

* Inflamed mucous membranes, generally speaking, are more disposed to pour out a purulent, or muco-purulent fluid, than coagulable lymph; but, when the inflammation is violent or peculiar, as it is in croup, the latter substance will be effused.—ED.

is less consistent than the preceding. The croupy membrane is most commonly restricted to the larynx and upper part of the trachea; but, in other cases, it extends over a great portion, or even the whole, of the bronchial ramifications. Sometimes, the disease is confined to the bronchiæ and their ramifications. More commonly, as has been shown by Bretonneau, the inflammation commences on the tonsils or the pharynx, and from thence spreads, at the same time, downwards to the larynx, and upwards to the nostrils. The affection usually stops at the œsophagus, but occasionally the false membrane extends to the stomach. In children, the disease almost always begins in the bronchiæ, or larynx, and very rarely extends beyond the glottis; while, in adults, it more frequently originates on the tonsils or pharynx. M. Bretonneau has also shown that what may be called plastic angina, has been frequently mistaken for malignant sore throat. While, however, Dr. Forbes admits the correctness of the statement, that what has often been considered as a gangrenous affection of the throat is merely an inflammation of the same kind as that of croup, and characterized by the formation of a membranous exudation of a peculiar kind, he does not assent to the proposition, that simple croup, or croup unaccompanied by any pharyngeal affection, does not exist as a separate disease.]*

Dr. Cullen asserts that acute croup seldom attacks infants till after they have been weaned, and that there is no instance of its occurring in children above twelve years of age. As a general rule this remark holds, but the disorder is by no means unfrequent in infants at the breast, of which I had one example not long ago: and it has been found occasionally in persons considerably above twelve years of age.† Those who have once had it are more susceptible of it than before; though the susceptibility gradually wears off as they grow older. It is found equally in midland regions and on the coast, but, perhaps, more frequently in low, marshy grounds than in drier uplands. [Our author believed that there is no unequivocal instance of its being contagious, though it is occasionally epidemic: and Dr. Elliotson has never seen a case in which the circumstances satisfied him that it originated from contagion.—(*Med. Lect. at Lond. Univ., vid. Med. Gaz.* for 1832-3, p. 66.) Some modern practitioners, however, among whom are Lobstein (*Mem. de la Société Méd. d'Emulation*, vol. viii.) and Bretonneau (*De la Diptherite*, 8vo., Paris, 1826), mention contagion as one of the causes of croup. A fact recorded by the latter physician, and quoted by M. Guersent (*Nouveau Dict. de Médecine*, art. Angine Couenneuse), is considered by M. Louis to be perfectly conclusive on the point. In another instance, related by M. Lobstein, a young girl who had not been exposed to the same atmospheric influence as her sister, already ill with croup, was attacked by it after having been playing with her at the time when her disease was completely developed. Dissection after death left no doubt of the nature of the disease. Other facts, tending to prove the contagious nature of croup, are adverted to by M. Louis. Professor Laennec also refers to a case showing the danger of respiring the patient's breath too closely.—(Op. cit., p. 125.) The asthenic croup, described by Bretonneau as occurring in the hospitals of France, and often joined with malignant angina, is certainly contagious.]

Acute bronchlemmitis commences usually in the evening, with a slight cough, hoarseness, and sneezing, as though the patient had caught cold, and was about to suffer from a catarrh. And to these, in a day or two, succeed a peculiar shrillness and singing of the voice, as if the sound were sent through a brazen tube. "At the same time," says Dr. Cullen, who has well described the progress of the disease, "there is a sense of pain about the larynx, some difficulty of respiration, with a whizzing sound in inspiration, as if the passage of the air were straitened. The cough which attends it is sometimes dry; and, if any thing be spit up, it is a matter of a purulent appearance, and sometimes films resembling portions of a membrane. Together with these symptoms, there is a frequency of pulse, a restlessness, and an uneasy sense of heat. When the internal fauces are viewed, they are sometimes without any appearance of inflammation; but frequently a redness, and even swelling, appear; and sometimes, in the fauces, there is an appearance of matter like that rejected by coughing. With the symptoms now described, and particularly with great difficulty of breathing, and a sense of strangling in the fauces, the patient is sometimes suddenly cut off."—(*Pract. of Phys.*, cccxxiv.) To which I may add, that the countenance exhibits great distress; the head and face are covered with perspiration from the violence of the struggle; the lips and cheeks are alternately pale and livid.

Dr. Cheyne, who has written one of the best treatises on croup in the English language, has adverted to the following changes, as indicating the different stages of the disease and the degrees of danger.

1st, There is a ringing, croupy cough (to which many children are liable upon taking cold, more particularly those who have had an attack of croup), attended with little or no change in the breathing or sound of the voice.

2d, The unusual shrill, croupy cough, with difficult breathing; the necessary supply of air being with difficulty inspired, from the obstruction of the passage. The voice is altered, bro-

* See Laennec on Diseases of the Chest, p. 119, 2d edit., transl. by Forbes; also, M. Bretonneau sur la Diptérite, Paris, 1826; and P. Ch. A. Louis, Mém. et Recherches Anat. Pathol., p. 242, &c., Paris, 1826.

† Du Croup, considéré chez l'adulte, in Mém. et Recherches Anat. Pathol., Par M. Louis, p. 203, &c., Paris, 1826. According to Dr. Cheyne, the disease may occur at any period, from the second or third month after birth to puberty; and he believes, with Professor Home, that the younger children are when weaned, the more liable are they to croup. After puberty it rarely occurs.—*Cyclop. of Pract. Med.*, art. Croup.

ken, both hoarse and puling. The difficult breathing in croup has been compared to the sound of air passing through thick muslin: it rather appears, says Dr. Cheyne, like the sound of a piston forced up a dry pump. It varies considerably, however; for it is either like the sound to which it has just now been compared, dry and hissing, audible in different degrees; or, when the swelling and spasm of the larynx are greater, it is crowing, and sometimes creaking and suffocative. Under this extremity of difficult breathing, children are said to have perished.

3d, The cough and voice are stridulous; the respiration is difficult, laborious, creaking, sometimes suffocative, varying in the degree of difficulty and laboriousness.

4th, The voice is whispering and low; the cough less frequent, and not audible at the opposite side of the room. There is the act of coughing without the sound; the respiration increasing in difficulty and quickness, laborious and interrupted.

1. According to Dr. Cheyne, the first is a state which is rather the forerunner of an alarming attack of croup. It is often without danger. It points out the children, who, when exposed to the usual excitements, are most liable to croup.

2. When, with the croupy cough, the breathing continues difficult, the serious attack has commenced, and the child is in danger. In this state, the skin is warm, the tongue white, the pulse full and quick, and the countenance much flushed. The usual mucous secretion is interrupted; the patient, if not an infant, is timid and apprehensive; and the eyes are heavy, watery, and bloodshot. The degree of danger is now to be estimated by the breathing.

3. This state denotes the second stage of croup, or that of effusion, which, according to Dr. Cheyne, is generally hopeless. The countenance is still flushed; but with marks of defective circulation. The lungs no longer purify the blood. There is a purple redness in the cheeks, eyes, and nails. The complexion is often mottled, or the flush on the cheeks is circumscribed. The pulse is smaller and very quick. There is sometimes an expectoration of mucus, mixed with flakes of puriform matter. The urine has a sediment in it. The eyes are prominent and bloodshot; the pupil is dilated, and the iris pale. When the breathing is most violent jactitation occurs, and lethargy when it is least disturbed.

4. This is the morbid state. The trachea is coated with effusion. The face is leaden, and the eye filmy. The extremities are cold and swelled. The muscular power is exhausted, and the child nearly insensible.—(*Cheyne's Pathology of the Larynx and Bronchia*, 8vo., Edinburgh, 1809.)

The editor deems the following observations, made by Professor Laennec on the symptoms of croup, well deserving of attention. If we except the expectoration of membranous fragments, or the appearance of false membrane in the fauces, not one of the symptoms is pathognomonic. The crouping voice, or sound, independently of its not being always well marked, does not occur until after the disease has made great progress. The cough, he says, is similar, or nearly so, in other diseases, particularly in certain cases of hooping-cough, in which the *sonorous inspirations* sometimes perfectly resemble the crowing of a cock. Laennec had of late only met with one case of croup sufficiently severe to be recognised from the beginning. It was soon more fully characterized by the expectoration of fragments of false membrane, moulded on bronchiæ of different diameters. In this case, which occurred in a child six years old, the stethoscope detected, during the whole course of the disease, no other respiratory sound but that of a *dry respiration*, evidently tubular or bronchial, unmixed with any of that crepitous dilatation of the pulmonary cells so strongly marked in infancy. This sign, coinciding with a natural resonance of the chest, will suffice, if it is constant, to indicate croup affecting the bronchiæ; since it exists in no other case, except sometimes, and in a much less degree, in dilatation of the bronchiæ; a chronic affection, generally of very partial extent, and not liable to be confounded with croup.]—(*Laennec*, op. cit., p. 124.)

The essence of croup consists in the secretion of the viscid and concrete lymph, which is perpetually endangering suffocation. Dr. Cullen does not dwell sufficiently upon this symptom; but ascribes the danger principally to spasmodic action, and represents the accompanying fever, which, on his hypothesis, is also a spasmodic action, to be very considerable; but spasm was with him, as we have already seen, a favourite doctrine, and his judgment was often warped by it. Dr. Marcus, who regards all fevers as inflammation of some organ or other, and as entirely seated in the arterial system, regards croup also as a local inflammation alone, utterly independent of spasm, which neither exists here nor in fevers of any kind; and attributes the danger to this symptom solely: which is the more extraordinary, as he regarded croup to be a disease identic with hooping-cough, in which the spasm or convulsion is the most prominent symptom. [Croup, even when most partial, is almost always attended with great constitutional disturbance. In the majority of cases, the symptomatic fever is acute, and very severe; the action of the heart being frequently irregular. In some cases, particularly such as occur in hospitals, it is observed by Laennec, that the pulse is but little accelerated, the skin rough and dirty, the debility extreme, and the breath fetid, even where no gangrenous specks exist in the throat. This variety is denominated asthenic by Guersent and Bretonneau, and is that which is found sometimes to accompany malignant sore throat.]—(*Laennec*, op. cit., p. 123.) The locality of the disease, as well as the peculiar character of the inflammation, sufficiently distinguish it from catarrh, in which there is also some inflammation of the mucous membrane of the trachea, though of a common kind, and rarely limited to this organ. In children,

however, it frequently treads close upon catarrh, measles, hooping-cough, and any other disease that has debilitated the powers of the lungs: for, as Dr. Michaelis observes, whatever tends to weaken or produce any degree of irritation in the lungs, so as to occasion a preternatural secretion into that organ, may be considered as a predisposing cause of croup.* Professor Dupuy, of the Veterinary School at Alfort, gives an instance of its having been communicated in a village, in which it was epidemic, to a dog, brought under his care from a mistaken idea that the dog was suffering from hydrophobia. During the progress of the disease this animal had the shrill, ringing voice of children labouring under it; and speedily died of suffocation. On opening the body, a false membrane was found in the larynx, of a reddish colour, which extended to the bronchiæ; and the lungs were filled with an abundant serous effusion.—(*Bibl. Méd.*, Août, 1822.)

[M. Louis has published some highly interesting observations on the croup of adult persons, and ably pointed out both its agreements with, and difference from, the same disease in children. In the latter subjects it resembles at first a slight cold, speedily followed by pains in the forepart of the neck, and usually unpreceded by sore throat. The cough soon becomes violent, recurring in paroxysms: there is a hissing sound in the breathing; with dyspnœa; the croupal voice, &c. On the contrary, in adult patients, there is more or less soreness of the throat at the very commencement of the attack, accompanied with heat, difficulty of deglutition, and little or no cough. The inflamed tonsils and pharynx soon become covered with coagulable lymph, and then pain begins to be experienced in the larynx and trachea, speedily followed by dyspnœa, anxiety, change of the voice, but rarely with suffocative paroxysms, even in the last hours of existence. M. Louis, however, regards this description as only generally applicable, since, in many cases lately recorded, children are represented to have had a soreness of the throat as one of the earliest symptoms; and, according to M. Guersent, croup frequently begins in this way in infants at the breast. In the croup of adults, the nasal fossæ, the pharynx, the velum palati, the uvula, the tonsils, the larynx, the trachea, and sometimes the bronchiæ, were found, on dissection, covered with coagulable lymph, or a false membrane, the consistence and thickness of which diminished according to the order in which the parts are here specified.]—(*Mém. et Rech. Anat. Path.* pp. 239–242, &c.)

The cure demands prompt and active remedies; and must depend, not so much upon searching into and correcting the remote cause, or even counteracting the spasm, as in counteracting the inflammation, preventing the further effusion of lymph, and promoting the loosening and discharge of that which already invests and obstructs the larynx and trachea.

There is in the patient a perpetual effort to remove this solid secretion by coughing; but the cough is for the most part dry and ineffectual, and nothing more than a little flaky mucus is excreted. Very copious bleeding* at the commencement of the attack, by breaking down abruptly the inflammatory action, has sometimes carried off the disease at once. This M. Fieliz and Dr. Cheyne recommend from the jugular veins (*Fieliz, Richter's Chir. Bibl.*, b. viii., p. 531), and M. Ghisi by topical scarifications; but, in infancy, leeches will usually be found to answer best; and, in adults, their repeated application may be useful after general bleeding. Emetics have afterward been tried, but with doubtful success: sinapisms and blisters, with as little.

[It deserves to be mentioned, however, that all these means are spoken favourably of by Professor Laennec (Op. cit., p. 126–7) and Dr. John Forbes; and that emetics are the remedy in which Dr. Cheyne has most confidence. When an attack of croup is apprehended, the latter physician prescribes an emetic, the warm bath, a dose of jalap and calomel, and dilution. When the first stage is formed, he has recourse to an emetic, the bath, a mercurial purge, venesection, a blister over the sternum, calomel in doses of one, two, or three grains every hour, diluents, and the antiphlogistic regimen. In the second stage, emetics are his chief remedies; and he has recourse to cordials when the strength flags.] The inhalation of warm vapour, recommended by Dr. Home, can rarely be practised, from the extreme restlessness of the little patient; and the remedy principally relied upon in the present day, and which certainly seems in many instances to have operated like a charm, is large and repeated doses of calomel; of this, not less than five or six grains are commonly given to very young children, and continued every two or three hours till there is a discharge of a green bilious matter, which seems to be the criterion of its having

* On the coast of the Frith of Forth the disease is said to be endemic; and it is also alleged to prevail to a great extent on the coasts of Ireland, in the winter and spring seasons. These facts are noticed by Dr. Cheyne (Cyclop. of Pract. Med., art. Croup), who ascribes one principal exciting cause of croup to the influence of large bodies of water in the vicinity of any place, where the disease is remarkably frequent. On this principle, croup ought to be endemic on every part of the seacoast: no doubt there must be other circumstances concerned. The exciting cause is undoubtedly, in almost every instance, cold and wet; and hence its greater frequency in spring and winter than in other seasons. It is more common in northern than southern latitudes, and sometimes epidemic. An age under twelve years might be regarded as a predisposing cause of the disease.—Ed.

* Michaelis, Richter's Chir. Bibl., b. v., p. 739. Dr. Elliotson recommends bleeding from the arm or jugular vein, and the application of leeches to the throat. He would follow up general by local bleeding; and, after promoting the hemorrhage from the leech-bites with a poultice, would put on a blister.—(Lect. at Lond. Univ., as published in Med. Gaz. for 1832–33, p. 66.) A proposal has been made to apply ice in a bladder to the throat, after the leech-bites have bled well.—Ed.

taken effect, and not only excites a salutary counteraction, but prevents the further secretion of thick lymph. [The mercurial practice, joined with the antiphlogistic, is that of which the editor's observations lead him to entertain the highest opinion. The free and quick exhibition of calomel was first proposed by Dr. Rush, and afterward recommended by Dr. Hamilton. It has the sanction of Professor Elliotson, who pronounces it to be a better practice than that of giving emetics.] Relaxants, as antimony and ipecacuanha, should be employed during the action of the calomel: and as soon as this has answered, sedatives, as opium or hyoscyamus, may be united with the relaxants: but, above all, the hydro-cyanic acid, as already recommended in hooping-cough, and to the same extent. If this plan should not succeed, Dr. Michaelis recommends tracheotomy; and has so little apprehension of its being attended with danger, that he advises it to be had recourse to soon after the attack, as affording a convenient opportunity of bringing away the preternatural membrane which serves as a lining to the trachea.—(*De Angină Polyposâ*, &c., ut suprà.) But this advice is given with more courage than judgment. Whenever the operation is performed, it should be after every other remedy has failed, and not before any other has been attempted. [When the exudation extends through the trachea, and ramifications of the bronchiæ, as the pathological observations of Laennec, Louis, and many other writers, prove to be frequently, though not always the case, there will be but little hope of benefit from such an operation.—(*Boyer, Traité des Mal. Chir.*, &c., tom. vii., Paris, 1821.) Dr. Cheyne also long ago showed, that the operation cannot be necessary for the purpose of letting air into the trachea; for in patients who died of the disease, he found a pervious canal one fourth of an inch in diameter.* He considered the operation as equally unfitted for the removal of the membrane; for, from its extent, tenacity, and adhesions, this is almost always impracticable; and even if it could be extracted, respiration would be but little improved, as the ramifications of the trachea and bronchial cells would still remain obstructed.†

The question relating to this operation is intimately connected with another point; namely, how far the fatal result of croup may be really owing to the obstruction of the glottis with coagulable lymph. If, says M. Louis, the false membrane lessen the air-passages of a child more than those of an adult, it is seldom in a degree sufficient to produce a mechanical impediment to the free circulation of air; and as death frequently occurs in children after the false membranes have been expectorated, this result is no longer ascribable, at least in all cases, to the mechanical impediment to the entrance of air into the lungs. The cases and dissections recorded by M. Louis, prove how rarely this impediment exists in the adult, in whom death takes place notwithstanding the breadth of the larynx; and he inclines to the opinion, that too much stress has been laid upon the mechanical obstruction of the air-passages, as an explanation of the cause of death in children: he imputes more effect to the spasm of the glottis and trachea; an explanation which he conceives is equally applicable to the adult and the young subject. But he observes, that it ought not to be forgotten, that the spasmodic symptoms never occur until the larynx has been lined with coagulable lymph, and hence this lymph, and the inflammation of which it is the production, are, in the opinion of M. Louis, always the primary cause of the spasm. He also adverts to various dissections by himself, M. Lobstein, and M. Viesseux, from which it appears that the lungs and other organs do not exhibit after death the appearances commonly found in cases of asphyxia. At the same time, he conceives that the deficiency of respiration has a share in producing the fatal termination, but that the functions of the heart and lungs cease simultaneously, so as to make a difference from asphyxia, strictly so called.—(Op. cit., p. 245.) The course of the disease, according to the view taken of it by Dr. Cheyne, is increased action, effusion, laborious respiration, circulation of blood with venous colour, sensorial debility, and death.]

Dr. Harden, of St. Petersburgh, has of late, after every other remedy had failed, ventured upon cold affusion. He first tried it, in a fit of despair, upon a child of his own, eighteen months old. The child was placed in a bathing-tub, with its belly on a cushion of hay; and a pail of water, 12° Reaumur, was then poured quickly from the head along the spine. The symptoms, after the first affusion, soon diminished; the operation was repeated at intervals, ten times, and the child recovered. He has since employed it with like success in the first stage of the disease; and Dr. Miller, another physician of St. Petersburgh, is said to have been, still more lately, as fortunate as himself.—(*Extr. of a Letter from D. Von. dem Busch, of Bremen, to Dr. Eberle, of Phila.*, Jan. 6, 1822.)

Under the genus LARYNGISMUS, belonging to the second order of the preceding class, I have observed, that the spasmodic affection there described, from its inducing a sense of suffocation, and possessing various other symptoms resembling those of croup, has often been mistaken for this last complaint, and been denominated spasmodic croup; though without the pathog-

* In the dissections of four patients who died of this disease, as recorded by Dr. James Jackson of Boston, the mucous membrane of the larynx was inflamed, but there was no false membrane or lining of coagulable lymph, and the trachea was pervious.—See N. E. Journ. of Med. and Surg., vol. i., p. 383.—D.

† See Cheyne's Pathology of the Larynx and Bronchia, Edin., 1809. Dr. Elliotson has tried bronchotomy without success; yet, after the failure of bleeding, mercury, blisters, cold applications, and even emetics (in which last he does not seem to put great confidence), he conceives that, if the patient's friends consented, after being told of the very slender chance of bronchotomy proving useful, such chance ought to be taken.—Lect. at Lond. Univ., as published in Med. Gaz. for 1832–33, p. 67.—ED.

nomonic sign of a membrane-like exudation, and for the most part without any inflammation whatever. It attacks children suddenly, most frequently in the night, and is apt to return in paroxysms, with short intervals of ease; while the real acute croup has no intervals, but continues its alarming course, till it destroys the patient, or yields to the means made use of. During the action of the spasm, in the former case, however, there is a considerable hoarseness and shrillness in the voice, and, from the struggle, a profuse perspiration about the head and face. Violent as these symptoms are, they commonly yield to a brisk antimonial emetic: after the operation of which the patient commonly falls into a sound sleep, and awakes with little remains of the complaint.

The SECOND OR CHRONIC VARIETY OF BRONCHLEMMITIS I have introduced chiefly on the high authority of Dr. Warren, who calls it, as I have already observed, a bronchial polypus; a term which may lead to mistakes; and which, in its application to any other part of the body, does not import the febrile action which exists as a characteristic of this disease. A concrete parenchymatous material, obstructing the bronchial vessels, coughed up in smaller or larger masses, sometimes easily and without any attachment to the sides of the bronchial tubes, and sometimes so extensively inosculated by radicles or radiating vessels as to produce a fatal hemorrhage on their being thrown up with violence, has been noticed from a very early period in the history of medicine to the present day. Bartholine, Tulpius, Ruysch, Gretz, and Morgagni, have all been appealed to as giving examples of this affection; and it is very possible that even Hippocrates may allude to something of the kind (*De Morb. Popular.*, lib. vii., sect. xli.) in the case of Phericides, who, he tells us, was accustomed to bring up from his lungs, in a fit of coughing, γαλακτώδεα, "white milky concretions;" and at length, before he died, οἷον ἐκ μύξης μυκητὰ, ξυνεστηκήτα, λευκῷ, φλέγματι περιεχόμενα, "firm mucus-like excrescences, surrounded with white phlegm." But the complaint does not seem to have been distinctly described till Dr. Warren's history of it.—(*Med. Trans.*, vol. i., art. xvi.) The case by which he chiefly illustrates it, is that of a young lady, eight years of age, of a strumous habit, who was suddenly attacked with difficulty of breathing, attended with a short, dry, and almost incessant cough; but without any pain in the side or chest. The symptoms diminished in the ensuing night, and the complaint appears to have been productive of little inconvenience for six weeks; when it returned with additional severity, with costive bowels, a white but moist tongue, and a pulse too quick to be counted. Bleeding, purgatives, and the oxymel of squills relieved her, but the breathing was still laborious; she had wasting night-sweats, and the pulse beat from a hundred to a hundred and twenty strokes in a minute for the ensuing twelve days; at the close of which period she awoke suddenly in the night, and was almost choked in bringing up, by coughing, what Dr. Warren calls "a large polypous concretion." It came up without either blood or mucus, and instantly gave her great relief. For two months afterward, she seldom passed three days without coughing up masses of the same kind, but none so large: she was tolerably easy when sitting still, or in motion in the open air; and though her pulse never beat less than a hundred and twenty strokes in a minute, she had a good appetite, gained some degree of strength and flesh, and entirely lost her night-sweats. She was now suddenly attacked at night with another paroxysm of distressful breathing and a sense of suffocation, and, in the morning, threw up a larger membranous concretion than at any time antecedently, and in the course of the four ensuing days, a quantity quite as large as in the six preceding weeks. From this time the oppression on the lungs returned irregularly after intervals of five, eight, ten, or twenty days, always followed and always relieved by an expuition of the same concrete material; till at the close of a twelvemonth from the first attack, the patient complained of a pain in the right heel: an abscess formed there, and the os calcis was found carious. From this time the bronchial affection ceased, the breathing was perfectly free, and no more concretion was thrown up.

Dr. Warren conceived this concrete substance to have been secreted by the mucous glands of the bronchial vessels. But the existence of fibrin, as a constituent part of the blood, was unknown at the period in which he wrote; and his plates and description of the membranous matter expectorated, show evidently that, like that discharged in croup, and often from the intestinal canal, it was composed of this formative element, intermixed with gluten, secreted in layers, and affecting a tubular structure.

In connexion with the plan of treatment already pointed out, it is highly probable that much benefit might, in this chronic form of bronchlemmitis, be derived from the use of mercury and foxglove, and a seton or issue.

Since the publication of the second edition of this work, M. Bretonneau,* in his treatise on the specific inflammations of the mucous membrane to which we have just referred, has noticed another form of this disease, in which the inflammation either spreads from the trachea to the tonsils and pharynx, or, as is more commonly the case, begins in the latter with the ordinary symptoms of paristhmitis maligna, or malignant sore-throat. In the cases to which he refers, this last disease was epidemic and contagious: and when the affection took this complicated course, the ulcerative process ceased, and the concrete membrane was produced in its stead. There seems to have been something peculiar in the season or the locality that could thus deflect the inflammation of quinsy from its ordinary course, though we meet with instances

* Dr. Bard, of New-York, in a Treatise on Croup, published fifty years before the date of Bretonneau's work, is said, by a French writer, to have pronounced croup and gangrenous angina to be identical.—See Dict. de Med. et de Chir. Pratiques, tom. ii., p. 544.—Ed.

of modification at times in other inflammations. A speedy cure was sometimes obtained by a rapid and momentary application of concentrated muriatic acid on a piece of sponge, where the inflammation could easily be reached; but, in other cases, it best yielded to a free course of calomel and mercurial friction.—(*Des Inflammations Spéciales du Tissu Muqueux*, &c., 8vo., Paris, 1826.)

[Dr. Cullen, as we have mentioned, noticed the occasional redness of the fauces in croup; and, as the subject was also considered by Dr. Cheyne, some of the observations of M. Bretonneau may not appear altogether new. Dr. Cheyne objected to the plan of regarding the disease as croup, when variously complicated; but, as an able critic has remarked, if the cough, voice, and mode of breathing be those of croup, and if a membrane be actually found on dissection after death, although sloughs may have been observed on the uvula and tonsils, and although the paroxysm may have supervened to, or been complicated with scarlatina, with measles, or with smallpox, still it is croup; not, indeed, pure and idiopathic, but, though complicated, still croup, still inflammation of the larynx and trachea, exudation, and formation of membrane, giving rise to the same series of symptoms which distinguish idiopathic croup.* The cases and dissections recorded by M. Louis (Op. cit., p. 204, &c.), materially corroborate the doctrine defended by the anonymous critical writer.]†

* Edin. Med. Journ., vol. v., p. 457. According to M. Bretonneau, diphtheritis does not yield to bleeding; and, notwithstanding the train of inflammatory effects attending it, its progress is arrested by stimulants, as the hydrochloric acid, alum, and the chloruret of lime. Hence Andral infers, that though congestion exists, it does not constitute the whole of the disease.—Anat. Pathol., tom. ii., p. 233.—ED.

† American practitioners have added not a little to our knowledge of croup. In 1781, Dr. Bayley, of New-York, in a communication addressed to Dr. Hunter, of London, ably discriminated between croup and the sore-throat distemper: he maintained the inflammatory character of croup, and strongly recommended repeated bleedings ad deliquium, the free use of tartar emetic, blisters, &c.—(See an Historical Review of some early American writers on croup, by Dr. J. B. Beck, in the New-York Med. and Phys. Journ., vol. i., p. 257.) According to Dr. Hosack (Med. Essays, vol. ii.), the disease sometimes attends other affections, as scarlatina, smallpox, measles, &c.; hence he divides it into two species, viz., idiopathic and symptomatic: "idiopathic, where the disease is primarily and exclusively situated in the trachea, bronchia, and surface of the lungs; symptomatic, where it is the consequence of other previous diseases." Dr. Hosack adopts the remedial measures for the cure of croup according to the three stages into which he divides the complaint: in the first, or forming stage of this disease, we must employ the most active means for restoring the suppressed secretions of the trachea and surface of the lungs. For this purpose, he directs an active emetic of tartarized antimony and ipecacuanha. Blood-root (sang. Can.), is highly recommended in this stage by Dr. Nathan Smith; and of this remedy Prof. W. Tully remarks, "that if given early, it may be considered as almost a specific."—"In the second stage," says Dr. Hosack, "such is the determination of the circulating fluids to the part affected, that the most efficient means of diminishing the plethora of the bloodvessels, and of diverting the irritation from the part affected, become necessary:" with this view he employs bloodletting, the warm bath, blisters, and calomel. If these remedies do not subdue the symptoms, and divert the irritation from the lungs and trachea, the third stage of the disease will ensue, termed the membranous or purulent stage. In this stage, Dr. Hosack relies on calomel in small and repeated doses; on the seneka snake-root, introduced as a remedy in croup by Dr. Archer, of Maryland; and on those medicines which excite the secretion from the lungs without impairing the general powers of the system. In this stage, Dr. Francis has succeeded in saving life when nearly extinct, by administering emetics of the sulphate of zinc, or of the sulphate of copper. This practice, which was introduced to the notice of the profession by Dr. Francis some eighteen years since, has been pursued with success by many eminent practitioners on both sides of the Atlantic, and particularly in Germany. For details of some cases treated with this remedy by Dr. Francis, see the New-York Med. and Phys. Journ., vol. iii., p. 54.—D.

SPECIES VII.

EMPRESMA PNEUMONITIS.

*PERIPNEUMONY.**

INFLAMMATION OF THE LUNGS; OBTUSE PAIN IN THE CHEST; CONSTANT DIFFICULTY OF RESPIRATION, ALLEVIATED BY AN ERECT POSITION; TUMID, PURPLE FACE, OR LIPS; COUGH, GENERALLY MOIST, OFTEN BLOODY; PULSE USUALLY SOFT.†

INFLAMMATION of the lungs has been described under many names. The most common, perhaps, is peripneumonia; for which pneumonitis, employed first, I believe, by Bourgaud, in his Dissertation, published in 1754, is here substituted, merely on account of the regularity of its termination. [The disease is one of the most severe and frequent, and in cold and tem-

* This word "is more properly applied to inflammation either of the air-cells or the cellular membrane around them, whichever it may be. I have no doubt, however, that the inflammation is inflammation of the air-cells themselves."—(Professor Elliotson, in Lectures at Lond. Univ. as published in Med. Gaz. for 1833, p. 130; also Andral, Clinique Méd., tom. ii., p. 312.) An inflammation of the parenchyma of the lungs, occasionally, but not necessarily, extending to the pleura investing them.—(Dr. C. Williams, in Cyclop. of Pract. Med., art. PNEUMONIA.) When the pleuritic covering is involved, Andral terms the case pleuro-pneumonia.—ED.

† The common well-known symptoms of this disease, those which are discernible without the aid of the ear, are pyrexia; general feverishness; rapidity and shortness of respiration; cough and expectoration.—(See Elliotson's Lect., op. cit.) The following is the character which Dr. C. Williams considers as most generally applicable to pneumonia; fever, with more or less pain in some part of the chest; accelerated, and sometimes oppressed, breathing; cough, with viscid and rusty-coloured expectoration; at first the crepitant ronchus, afterward bronchial respiration, and bronchophonism, with dulness of sound on percussion in some part of the thorax.—ED.

perate climates, is calculated by Laennec to be productive of more deaths than any other acute disease.]

The disease, as above characterized, is traced under the three following varieties:—

α Vera. True Peripneumony.	Fever a cauma; pain severe, little expectoration in the beginning.
β Maligna. Malignant Peripneumony.	Fever a synochus or typhus; the debility extreme from an early period. Often epidemic.
γ Notha. Spurious Peripneumony.	Great secretion and expectoration, with a mild cauma. Occurring in weakly habits, and often connected with a catarrh.

The FIRST of these varieties, or TRUE PERIPNEUMONY, is perhaps the most common, and has been more generally treated of than the rest.

Dr. Cullen has united inflammation of the parenchyma of the lungs, which is here alone contemplated, with inflammation of their membranes; believing that we have no means of ascertaining a difference from the course or concomitancy of the symptoms, and, in this view of the disease, he has been followed by Professor Frank (Op cit., tom. ii., sect. 185), who, however, retains the term *pleuritis*, but limits it to what has occasionally been called *bastard pleurisy*. In pleurisy, however, the face is comparatively but little flushed, and far less tumid; the pulse is harder; the cough less violent, and, from the beginning to the end, without expectoration; the seat of pain also is fixed: while in peripneumony it shifts not only to different parts of the same side, but often from the one side to the other. However, some degree of pleurisy frequently accompanies pneumonitis from continuous sympathy (*Morgagni, De Sed. et Caus. Morb. Ep.*, art. 13, 14, 37); but then it is not idiopathic pleurisy, nor strictly possessed of its symptoms. ["Nothing is more common," says Professor Laennec (Op. cit., p. 125), "than to find pneumonitis altogether simple, or complicated only with so slight a degree of pleurisy as in no respect to increase its danger, or modify its progress."] Percussion, if skilfully managed, will often ascertain the particular part in which the inflammation is seated, but the stethoscope will prove a still better diagnostic.

Inflammation of the substance of the lungs bears nearly the same relation to pleurisy, or inflammation of the membrane that lines the chest and covers the lungs, as profound or parenchymatous cephalitis bears to meningic. The two former, however, are somewhat more distinct, and less liable to run into each other than the two latter; because one half the pleura, from its duplicature, is more remotely situated from the lungs, and less connected with them. And I have hence followed the ordinary division, and treated of pneumonitis and pleuritis as distinct *species*, rather than varieties of one common species, which is the view take of meningic and profound cephalitis. In both sets of disease, however, the membranous is the more acute affection, evinces more violent and painful symptoms, and runs through its course more rapidly. And hence, in pneumonitis, as in deep-seated phrensy, the pulse is sometimes soft (*De Cabanis, Phænom. Med.*), the fever small (*Cleghorn*, p. 262), and the disorder occasionally protracted to twenty days or more.—(*Stoll, Rat. Med.*, part ii., p. 376; *Act. Nat. Cur.*, vol. v., obs. 124.)

[According to Professor Laennec, the lower parts of the lungs are those most commonly occupied by pneumonitis; and he says, that when the disease involves the whole organ, it is almost always in the inferior part that it commences. These circumstances he views as affording a strong argument against the opinion of Broussais, that tubercles are the product of inflammation. "If this were true," he says, "the inferior and not the upper lobes ought to be the principal site of tubercles, but the reverse is well known to be the fact."—(Op. cit., p. 199.) From a note, however, inserted in Dr. Forbes's translation of Laennec's invaluable treatise, some doubt appears to exist respecting the correctness of this author's statement. It is, indeed, corroborated by Andral, although, as Dr. Forbes remarks, hardly in the degree we might have expected from Laennec's observations. Out of eighty-eight cases of pneumonitis examined by Andral, the lower lobe was affected in forty-seven; the upper lobe in thirty; and the whole lung in eleven.—(*Clin. Médicale*, tom. ii., p. 317.) Since the publication of Laennec's work, the pupils of Broussais have very often shown the latter physician cases of hepatization of the upper lobe; Frank even declares (Op. cit., tom. ii., p. 139) his own experience to be the reverse of Andral's. "Frequentius forte *superiores* pulmonum lobos inflammatos deteximus."—(*De Cur. Hom. Morb.*, tom. ii., p. 132.) In fifty-nine cases, examined by M. Chomel, there were thirteen examples of the upper lobes being affected; eleven of the lower; thirty-one of the whole lung; two of the posterior part; and one of the middle. The right lung is said to be more frequently attacked than the left, not only in cases of pneumonia, but in almost every other disease to which the lungs are subject. This fact, which is noticed by Morgagni, is confirmed by M. Andral, who has calculated, that out of two hundred and ten cases of pneumonia, recorded either at La Charité, or by Morgagni, Stoll, De Haen, Pinel, or Broussais, the right lung was affected in one hundred and twenty-one; the left in fifty-eight; and both lungs in twenty-five; the particulars of the other six being unknown.—(*Andral, Clin. Médicale*, tom. ii., p. 317.) In fifty-nine dissections, performed by M. Chomel (*Dict. de Médecine*, tom. xvii., p. 508), the right lung was affected in twenty-eight of the patients, the left in fifteen, and both in sixteen.]

The causes of true peripneumony are those of inflammation in general; particularly excessive exertion of the lungs, or cold applied to

the skin, mouth, and stomach.* It attacks the robust and plethoric more frequently than the spare and delicate. [While Laennec admits, that in such persons the inflammation is more acute, the fever higher, and the disease more easily recognised and cured, he asserts, that the disorder is much more common and fatal in old persons, in whom it is apt to run rapidly into suppuration. Children are likewise very subject to it, and the more so the younger they are.† "In them," says Laennec, "the disease is frequently mistaken, because they swallow the expectoration, and death mostly takes place before any hepatization has occurred, or only very partially." The facility with which they fall victims to the disorder at its very commencement, is ascribed by Laennec to the greater necessity of free respiration in early infancy.] The disease prevails most in cold weather, or sudden changes from hot to cold. [It is remarked by Laennec (Op. cit., p. 220), that cold operates as a cause much less powerfully when it immediately follows excessive heat, and is not prolonged. The Russian, who rolls himself in the snow after coming out of the hot bath, or the bakers, who go from their heated ovens into an atmosphere of a temperature below zero, escape the disease; while porters, whose occupation leads them to stand for a length of time at the corners of the streets, are frequently affected by it. In general, it is a disease of winter and cold climates, and is comparatively rare in the equatorial regions.] Noxious exhalations have sometimes proved a cause. To these we may refer the frequency of this disease in the outskirts of Mount Vesuvius, as remarked by Vivenzi (*Epist. ad Haller.*, iv.); and, on this account, it is described by Baronius (*Pleuropneumoniâ ann.* 1633, *Flaminiam infestante*, Fidi., 1536) and Bovillet (*Mémoires sur les Pleuropneumonies Epid.*, p. 556) as endemic. [The poison of serpents, and especially that of the rattlesnake, frequently brings on pneumonitis, and the injection of various medicinal substances into the veins has the same effect.‡

In an anatomical point of view, pneumonitis presents three degrees or stages, to which Laennec assigns the terms *obstruction*, or *engorgement*, *hepatization*, and *purulent infiltration*.

In the first stage, the lung is externally of a livid or violet hue, heavier, and much more solid than natural. It is, however, still crepitous, but much less so than in the sound state, and, on pressing it, we find that it is injected with fluid. It retains the impression of the fingers nearly like an œdematous limb. When cut into, it presents a livid or blood-coloured appearance, and a frothy, serous, more or less bloody fluid, issues from it in abundance. The natural areolar and spongy texture of the viscus, however, may yet be distinguished, except at some points where the part is more solid, indicating the transition from the first to the second stage.

In the second stage, or that of hepatization, the crepitous feel is entirely lost, and the lung has acquired the consistence and weight of liver. It is also frequently less livid externally than in the first stage, but internally its redness is more or less deep, the colour varying at different points from that of violet-gray to blood-red. With these different colours, as is pointed out by Laennec, a striking contrast is formed by the bronchial tubes, the bloodvessels, the specks of black pulmonary matter, and the thin cellular partitions dividing the pulmonary substance into portions or lobules of unequal size. These partitions, which, in a sound state of the organ, are not easily perceived, are now rendered quite distinct by their whiteness. If a portion of lung in this state be cut in pieces, hardly any fluid escapes from it; but if the incised surface be scraped, a little bloody serum may be collected, which is turbid and thick, and not unfrequently blended with another fluid which is thicker, opaque, whitish, and puriform. When the incised surfaces are exposed to the light, the pulmonary substance will be found to have entirely lost its cellular appearance, and presents a granular aspect, as if composed of small red grains, oblong and somewhat flattened. This granular texture is considered by Laennec to be the criterion of inflammation of the lungs, by which it may be best discriminated from the tubercular obstruction. The granular appearance is rendered still more conspicuous when a portion of hepatized lung is torn. The pulmonary substance now seems to consist of an infinity of small grains, round or oval, very equal in size, and of the several colours already men-

* This influence of cold is proved by the greater prevalence of the disease in cold seasons and cold climates. Of the cases described by Andral, the number occurring in March and April amounted to a third of the whole; the fewest took place in May, October, and November; and the remaining months had an equal share. Dr. C. Williams has observed the greater prevalence of the disease in London from the beginning of December to the end of April.—(Cyclop. of Pract. Med., art. PNEUMONIA.) Frequently undetermined epidemic influences are likewise concerned in exciting the disease.—ED.

† According to M. Guersent, three fifths of the children who die in the Hospital for Sick Children at Paris, before the completion of dentition, are cut off by pneumonia (Dict. de Med., tom. viii., p. 96); and Dr. C. Williams says, that of fifty-five cases of pneumonia, attended by himself and Mr. Byam, at a Dispensary in St. Marylebone, in the course of the year, thirty were in subjects only six years old, or under this age.—Cyclop. of Pract. Med., art. PNEUMONIA.—ED.

‡ A previous attack of pneumonitis leaves a considerable tendency to another. Rush refers to a native of Germany, resident in Philadelphia, who had the disease twenty-eight times; and Andral mentions one case, in which the disease recurred not less than sixteen times in eleven years.—(Clin. Méd., tom. ii., p. 129.) Dezoteux had under his care a patient seven times with pneumonitis, who had suffered fifteen attacks of it.—(Dict. des Sc. Méd., tom. xliii., p. 396.) Chomel alludes to its occurrence a tenth time in the same individual (Dict. de Méd., art. PNEUMONIE); also Dr. C. Williams (in Cyclop. of Pract. Med.), who observes, that, perhaps, the only other circumstance that can be fairly viewed as a predisposing cause, is the presence of tubercles in the lungs.—ED.

tioned. They are plainly the air-cells changed into solid grains by the thickening of their parietes, and the obliteration of their cavities by a concrete fluid. Andral even regards pneumonitis as consisting essentially in inflammation of the air-cells, the inner surface of which, he says, secretes at first a muco-sanguineous, and then a purulent fluid.—(*Clinique Médicale*, tom. ii., p. 312.) The hepatized lung seems at first sight larger than natural, but this is not the fact, and the appearance is referred by Laennec to the lung not contracting, as a sound lung does when the chest is laid open. He has measured the chest, but never found it to be dilated, which is one great difference of peripneumony from pleurisy.

In the third stage, or that of purulent infiltration, the lung has the same degree of hardness, and the granular appearance; but it is of a pale yellowish colour.—(See *Dr. Hope's Illustrations of Morbid Anatomy*, No. 1.) The pus, as it begins to form, appears in small detached yellow points, increasing the mottled colouring already noticed. By degrees, these points unite, and the whole lung assumes a uniform straw or lemon colour; and, when incised, pours out more or less of a yellow, opaque, viscid matter, evidently purulent, but much less fetid than the pus of a wound. The substance of the lung is also more humid and soft than the red hepatization. As the purulent softening increases, the granulated texture gradually disappears, and at length the parenchyma of the lungs breaks beneath the fingers. According to Laennec, when the lung contains much black pulmonary matter, as is commonly the case in adults and old persons, the pus and substance of the lung assume an ash-gray colour. At other times, particularly in children, the pus is of a whitish yellow colour. The collection of the pus in one cavity, so as to form a true abscess, Laennec represents as an uncommon result of pneumonia; a point, however, on which Professor Himley and Sir A. Crichton do not agree with him. The foregoing three stages are frequently combined. Sometimes the hepatized portions are exactly circumscribed by a lobule; and, in children more especially, we sometimes find in the centre of the lungs a certain number of lobules arrived at the stage of hepatization, while those immediately around them are perfectly sound. The lining of the bronchiæ is generally very red in the inflamed portions of lung: it is also occasionally swelled; and sometimes the redness pervades the whole bronchiæ, but this is uncommon. In the purulent stage, the membrane is sometimes pale, sometimes red or purple, and in both cases softened.

Laennec maintains, that the species of suppuration above described is the only one of common occurrence in cases of pneumonia; for the vomica of Hippocrates and modern practitioners, he says, is the result of the softening of a large mass of tubercular matter. Among several hundred dissections of peripneumonic subjects, he has not met with a collection of pus in an inflamed lung more than five or six times. They were not of large extent, nor numerous in the same lung. They were dispersed in different situations, and the lungs were in the third stage of inflammation. The walls of these abscesses were formed by the pulmonary tissue filled with pus, and in a state of soft disorganization, which gradually decreased as it receded from the centre of the collection. When we drag from the chest an inflamed lung, adherent to the pleura costalis, the parts most infiltrated with pus frequently give way, or, without breaking outwardly, yield internally under the pressure, so as to form a soft sanious mass (see also *Andral, Clinique Médicale*, tom. ii., p. 310): if cases of this kind were received as examples of pulmonary abscess, nothing would be more common. In the course of twenty years, Laennec had never seen in the lungs a true abscess of considerable extent except once, and in this case, as in all the rest where abscess was found, the inflammation occupied only a part of the lung.

As Dr. Forbes has observed, the testimony of Broussais on the foregoing point is also very strong; for he declares, he has never met with a case of ulceration, without tubercles, but once; and then the inflammation arose from the lodgment of a musket-ball six years in the lungs.—(*Hist. des Phlegm. Chron.*, tom. ii., p. 111.) Dr. Bright's work contains but a single example unaccompanied by tubercles.—(*Bright's Reports of Medical Cases*, p. 134.) The frequency of pulmonary abscess, as described by Dr. Baillie, and believed by the generality of English practitioners, is therefore considered by Dr. Forbes to be an error.

Laennec has seen the disorder continue in its first stage seven or eight days, and affect the whole of one lung and part of the other, and prove fatal before the occurrence of any distinct hepatization.—(*Andral, Clinique Médicale*, tom. ii., obs. 8 and 9.) On the contrary, in other cases, particularly when the disorder has attacked debilitated or very old subjects, or come on in the course of another severe malady, the inflammation reaches the stage of purulent infiltration in thirty-six or even twenty-four hours. With these exceptions, Laennec fixes the ordinary duration of the different stages of pneumonitis as follows: the first stage usually lasts from twelve hours to three days, before hepatization is completed; this, or the second stage, lasts from one to three days before spots of purulent infiltration appear; and the suppurative stage continues from two to six days.

With respect to what Laennec terms the physical signs of the disease, the crepitous rattle, as ascertained by the stethoscope, is the pathognomonic sign of the first stage. The sound of respiration is still heard distinctly, and percussion affords the natural resonance. The extent over which the stethoscope detects the rattle, denotes the extent of the inflammation. When hepatization has taken place, neither the crepitous rattle nor the respiratory sound can be distinguished in the part affected; but, if the inflammation be near the surface, or at the roots, or in the upper lobes of the lungs, bronchophonism, or a resonance of the voice within

the bronchiæ of the inflamed part may be perceived. The bronchial respiration and cough always accompany bronchophonism. In the third, or suppurative stage, as soon as the pus begins to soften, the mucous rattle of Laennec becomes more or less perceptible.]

The first symptoms are those of inflammation in general; but there is usually more shivering, or cold fit, and the hot stage is proportionally violent; the head aches considerably, and the urine is high-coloured, [or, to use Laennec's expression, it is of as deep a red as if it held blood in solution; and this character is as strongly marked as in any inflammatory disease whatever. The disorder is attended by active fever from its very beginning, the exceptions being rare, and only happening when the disease is of small extent. There is a great determination of blood to the head, and the face is much flushed.] The pain in the chest is rarely felt in any oppressive degree till these symptoms have continued for a day or two: though sometimes it is coetaneous. It is chiefly felt in a recumbent position, and more on one side than on the other. [It is obtuse and deeply seated. It is generally slight and extensively diffused; but sometimes confined to a point, even when there is no accompanying pleurisy. However, when it becomes very acute, it is commonly on account of the inflammation having extended to some part of the pleura.]* The cough is usually short, peculiarly distressing, and obstinate; [though, according to Laennec, sometimes so slight as not to be acknowledged by the patient or attendants. The expectoration has, in many cases, an appearance quite characteristic. The sputa, when received into a flat and open vessel, unite into so viscid and tenacious a mass, that we may turn it upside down, even when full, without the sputa being detached. Their colour is often a shade of red, particularly that of rust; or it may be sea-green, tawny, orange, saffron, yellowish, or dull green. These various colours are often intermixed in stripes in the same spot. The mass of expectorated matter has a semitransparency like that of horn. It is further remarked by Laennec, that if such sputa constantly existed in pneumonitis, no other sign of the presence of the disorder would be requisite. They commonly appear in the stage of obstruction, and retain their character until hepatization is advanced; but frequently they are less viscid, little coloured, and nearly destitute of air-bubbles; and, at other times, we perceive only a few glutinous and slightly tawny sputa, amid a great mass of mucous expectoration. Frequently the characteristic sputa are observed only at the very beginning of the disease, and sometimes not at this period, or only in such small quantity as hardly to admit of being collected. This is stated by Laennec to be particularly the case in old subjects, and in very rapid attacks. During the period of hepatization, the expectoration is slight and variable, but it usually consists of a small quantity of pituitous sputa, more or less viscid and vitriform, or of a whitish, or yellowish, and half opaque mucus. After the purulent infiltration occurs, the expectoration is more decidedly mucous, and like that in the latter stage of catarrh. It rarely becomes entirely purulent. Lerminier and Andral consider an expectoration of a mixture of blackish blood and diffluent pituita as characteristic of the period of suppuration.] The pulse is variable: in some cases hard and strong; in some, soft or oppressed; but, with the advance of the disease, it becomes feeble, sometimes fluttering. [When the determination of blood to the head is very great, and marked by coma in the beginning of the disease, as is often the case in old plethoric persons, the symptom is extremely unfavourable, as the patient then usually dies before hepatization is complete, or the inflammation reaches the stage of purulent infiltration in a few hours.] —(Op. cit., p. 217.) Delirium is an occasional accompaniment, and a highly dangerous symptom, except where it alternates with the pneumonic symptoms, in which case it augurs well. In favourable terminations, the violence of the disease diminishes on or before the seventh day: if it increase beyond this, it commonly proves fatal.

Peripneumony, like other inflammations, terminates in effusion, suppuration, or gangrene; and it has also a termination peculiar to itself, which is that of hemorrhage. The most salutary mode is effusion; for the vessels hereby become relieved, and the secements immediately add to the relief by commencing an increased action, and consequently an increased discharge of mucus. In consequence of effusion, however, we occasionally find adhesions take place between the lungs and the pleura; and sometimes a collection of water in different parts of the chest; and not unfrequently a flow of blood, apparently from the mouths of the exhalants, without any rupture of vessels, giving a bloody tinge to the sputum. This last has been often regarded as an alarming symptom, but the alarm is altogether unfounded, for it generally affords considerable relief. Indeed, a hemorrhage itself from the lungs has not always been attended with fatal consequences: it has occasionally proved critical, and carried off the disease in a few days; though a hemorrhage from the nose, no unusual attendant, is far preferable, as producing a like benefit with less risk. If the inflammation run into suppuration, the change is generally indicated by shiverings, with a remission of pain, and sometimes by perspiration where there has been none before. If gangrene ensue, the pulse sinks, the debility rapidly increases, and the eyes are fixed with a ghastly stare.

* Laennec, op. cit., p. 214. In several cases noticed by Andral, various degrees of pain had been experienced, though no mention is made by him of any inflammatory appearances on the pleura after death.—(Clinique Méd., tom. ii., obs. 29, 38, 43, 46.) This merits particular attention, because this eminent pathologist happens to observe in another place (p. 327), that pain is never experienced unless the inflammation extend to the pleura. This incongruity has been adverted to by Dr. C. Williams.—ED.

[With respect to gangrene of the lungs, it is rather uncommon; so rare in pneumonitis, that Dr. Elliotson has never seen it. The severest inflammation of the lungs, he thinks, seldom, if ever, brings on mortification.* Laennec (Op. cit., p. 221) is of opinion, that it can scarcely be reckoned one of the terminations of pulmonary inflammation, and still less the consequence of its intensity; since, in cases of this kind, the inflammatory character is very slightly marked, as well in regard to the symptoms as the appearances on dissection. He conceives, that there is some resemblance between gangrene of the lungs and that of anthrax and malignant pustule, in which the surrounding inflammation seems to be rather the effect than the cause of the sphacelus. Gangrenous excavations in the lungs constitute the ulcerous phthisis of Bayle.—(*Recherches sur la Phthisie Pulmonaire*, Paris, 1810.) The examples of this affection recorded by Dr. Bright, merit particular attention.—(See *Bright's Reports of Medical Cases*, p. 136, et seq., 4to., Lond., 1827.)

From the time of Hippocrates to the present day, pneumonitis has been considered as one of the disorders in which the abstraction of blood is productive of the most unequivocal good effects. The same agreement, however, has not prevailed with respect to the quantity of blood to be drawn at one time, the period of the disease when bloodletting ceases to be useful, and the part of the body from which the blood ought to be taken. The greater number of the ancient physicians, as Laennec has remarked, bled only at the onset of the disease, and allowed the blood to flow until syncope took place. The same practice is common in England, where physicians frequently direct twenty-four, thirty, or thirty-six ounces of blood to be taken away in the beginning of pneumonitis. In subjects not debilitated by age, or previous habits and disease, Dr. Good, in the former editions of this work, recommended the "bleeding to be prompt and copious, at least to eighteen or twenty ounces, and, if necessary, to be repeated in twelve hours." M. Andral states, that the first bleeding should be from sixteen to eighteen ounces, and that the operation may be repeated twice, or even thrice, within the first twenty-four hours.—(*Clin. Méd.*, tom. ii., p. 379.) The advantage of a very copious bleeding at the onset of pneumonia has been placed in a strong light by Dr. Robertson (*Edin. Med. and Surg. Journ.*, vol. x.), whose practical observations on the subject merit attentive consideration, and whose precept is supported by Dr. Gregory's celebrated aphorism, that "the danger of a large bleeding is less than the danger of the disease." However, notwithstanding the propriety of copious bleeding in the early stage of pneumonia, the extent to which the evacuation should be carried, ought certainly to be modified according to the age and strength of the patient. Hence, in the preceding editions, Dr. Good delivered the following caution:]—The chief evil is, that the fever is apt, at times, to run into a typhus form, and assume the second of the varieties before us. And hence, where there is any doubt upon the subject, local bleeding is to be preferred, whether by leeches or cupping-glasses, and repeated according as the evacuation appears to be demanded.

[This doctrine, that the fever of pneumonia is particularly apt to become typhoid, has always appeared to the editor one of doubtful validity. Having seen many cases of this disease in the public service, the experience which he has had makes him conclude, that the symptomatic fever of inflamed lungs is not more disposed to assume the character of typhus, than the fever resulting from the inflammation of other important viscera. The case of which he speaks, however, is not to be confounded with other examples, in which the pneumonitis is only an incidental attendant on typhus, which is the primary affection. As Laennec justly observes, a copious bleeding, in the beginning of the disease, reduces the inflammatory orgasm much more speedily than repeated smaller venesections, and leaves less chance of a relapse. And, with respect to the fear of bleeding, derived from the consideration of debility and dreams of typhus, although the patient's state of health and strength should always be allowed to modify the practice, and even sometimes to prescribe local instead of general bleeding, the editor believes that Diemerbroek's maxim, quoted by Dr. Forbes (*Laennec on Diseases of the Chest*, &c., 241, note 2d ed.), ought never to be forgotten, "præstat ægrum debilem sanari, quam fortem mori." And, as the latter physician inculcates, the vastly inferior power of bleeding in the second and third stages of pneumonitis ought to make us principally depend upon what we can effect in the first stage. Indeed, after the stage of hepatization, Lorinser (*Lorinser, Lehre von den Lungenkrankheiten*, p. 259) considers bleeding as useless, if not injurious. In the beginning of the case, however, when the patient is young, strong, or plethoric, venesection, and local bleeding, by means of leeches or cupping, may be simultaneously practised.*

On this particular subject, one valuable caution is offered by Laennec, namely, that, in pneumonitis, a weak pulse is not always a test of weakness: the feebleness, he says, is some-

* Dr. Elliotson has seen two examples, in which there was gangrene of the lungs under other circumstances: one was in a man, who had long suffered from a loud hollow cough; the other in a woman, who laboured under an encysted tumour of the pancreas. In her case a slight cough came on, which attracted no attention, and at last symptoms of gangrene appeared; cadaverous look; sudden prostration of strength; great feebleness of pulse; intolerable fetor of the breath and sputa.—Ed.

* Our author has not mentioned mercury as one of the means for subduing inflammation of the lungs. Dr. Elliotson regards mercury as quite as useful in this disorder as in bronchitis.—(Lect., see Med. Gaz. for 1833, p. 133.) It must of course be preceded by bleeding.—Ed.

times only apparent, and the pulse will become stronger and fuller after bleeding. For the removal of any doubt about the propriety of bleeding, when the pulse is weak, the stethoscope is mentioned as a most valuable instrument. According to Laennec, whenever the pulsations of the heart are proportionally much stronger than those of the arteries, we may bleed without fear; but, if the heart and pulse are both weak, the practice generally causes complete prostration of strength.

Blisters are employed in pneumonitis by the generality of practitioners, but with very little discrimination. The common error consists in applying them too early, in which circumstance they increase the fever, and do more harm than good. The best physicians seem now to agree, that blisters should not immediately follow the first bleeding, but be kept back till the acute stage has somewhat subsided.

With respect to purgatives in cases of pneumonitis, clysters and gentle laxatives are generally preferable to stronger medicines. The editor has seen two cases very lately, in which the expectoration seemed to be stopped by the operation of active purgatives, and the patients, though already benefited by bleeding, suddenly became worse, and died. As Dr. Forbes has observed, when pneumonia is complicated with gastric inflammation, strong purgatives are highly improper.

Refrigerants are frequently prescribed in this disease: one of the most common and useful is nitre;] which may be combined with the citrate of potash, or made to produce a more certain determination to the skin, by the addition of camphire or of antimonial wine, or by a combination with the citrate or acetate of ammonia.

In other countries, emetics have seldom been given except in an early stage of the disease, and then only as a gentle puke; yet, from my own practice, I can recommend them when the disease has made a considerable advance; but they must be used boldly, or so as to produce full vomiting, and the action of vomiting must be maintained for an hour, or even two; and in this way they will often produce a transfer of action of as beneficial a nature as the same process is found to do in purulent ophthalmia; and will, at the same time, peculiarly stimulate the exhalants of the lungs to an increased secretion of mucus. [On the continent, the free exhibition of tartarized antimony in pneumonitis has always had some partisans. To Laennec's knowledge, the practice was constantly followed by M. Dumangin, physician to La Charité, who scarcely ever joined bloodletting with it, and yet his practice was quite as successful as that of Corvisart, who bled much in this disease. Rasori, a modern Italian physician, first revived this method of treatment.—(*Storia della Febbre Petechiale*, &c., Milano, 1813.) After venesection, Laennec gives a solution of one grain of tartarized antimony every two hours, repeating the dose six times. After this, if the symptoms be not urgent, and the patient disposed to sleep, he leaves him quiet for six or eight hours. But, if the oppression be great, or the head affected, the medicine is continued, the dose being then sometimes increased to a grain and a half, or two grains, or even two grains and a half. Many patients bear the medicine without being either purged or affected with vomiting. Most of them, however, vomit two or three times, and have five or six stools the first day. On the following days they have very slight evacuations, and sometimes none at all. As soon as some amendment is produced, we may be sure, says Laennec, that the continuation of the remedy will effect a cure, without any fresh relapse; a point in which this practice is represented to differ especially from that of bleeding. Of forty-seven cases, treated by Dr. Hellis, of Rouen (*Clinique Méd. de l'Hôtel Dieu de Rouen*, 1826), by repeated emetics, only five were lost, being a proportion somewhat less than one in nine. Laennec experienced even greater success with large doses of the medicine. The average number of deaths, under the treatment with bleeding and derivatives, is computed to be one in six or eight cases. When the medicine operates too freely, Laennec joins a small proportion of opium with it.—(Op. cit., p. 250.)] M. Peschier, of Geneva, also prefers the treatment with tartarized antimony; and depends upon it alone, or nearly so, even discarding the lancet; for he gives it in large doses, so as to purge as well as vomit. His usual quantity at first is, according to the age, from six or eight to fifteen grains, dissolved in six ounces of water, which is taken in divided doses, in any diluting drink, in the course of twenty-four hours. And, under this plan, he tells us that he cured all his patients, old or young, without exception. He admits, however, the conjoint use of blisters, which ought unquestionably to form a concomitant in the general plan; and the obstinacy of the cough may be alleviated by demulcents, or inhaling the steam of warm water. [The plan of making tartarized antimony the chief means of treatment has not yet gained many advocates in England. With Dr. John Forbes, the belief of pneumonia being frequently complicated with gastric affections, influences him much against the practice, the merit of which, however, must be determined by experience.] Opiates have been tried in every form, but have never been found of decisive benefit; if opium be used at all, it should be in conjunction with gum-ammoniac or squills: but, upon the whole, either of these expectorants seem to answer best without opium. [The best, the easiest, and even the natural cure of peripneumony, is expectoration, which ought to be encouraged by all the means in our power. It forms the *optima crisis* of Stoll, though, as he adds, a crisis too rarely obtained.] Dr. Saunders recommended the extract of the white poppy; and that of the garden lettuce has since been tried, upon the recommendation of Dr. Duncan; others may have been more fortunate than myself, but, in my hands, both have proved altogether insignificant.

If the disease proceed favourably, the pulse

becomes slower and softer; the yellow, tenacious, and perhaps bloody sputum, is mixed with points of a whiter matter, which increases with the amendment of every other symptom; for the cough is less violent and straining, the breathing freer, the skin moister, and the tongue cleaner at the edges. If the progress be less favourable, the expectoration becomes darker and more viscid; the pulse lower, indistinct, and often intermitting; a low, wandering delirium supervenes, with subsultus; and the patient dies, apparently suffocated, from the oppressed vessels no longer permitting an expansion of the lungs.*

When a salutary expectoration has commenced, it sometimes ceases suddenly, from some unknown cause, or some irregularity in the mode of treatment. This symptom is alarming; and every means should be instantly taken to bring the discharge back; such, particularly, as increased doses of the expectorants already noticed, to which may be added the steam of vinegar, alone, or impregnated with the essential oil of aromatic plants, as rosemary. And if a diarrhœa, which sometimes proves a very distressing concomitant, should supervene, it will be best relieved by the pulvis cretæ comp. cum opio.

Inflammation of the lungs is also occasionally found as a symptom or sequel in rheumatism, lyssa, or canine madness; various exanthems, as smallpox, measles, miliaria, and commonly in phthisis; in which last it has a very frequent tendency to suppuration, as we shall have to notice when treating of this distressing complaint. [Peripneumony, thus forming a combination with other disorders, is termed by Laennec *latent* and *symptomatic*, being then particularly liable to be overlooked. Besides the cases just now specified, on which it is frequently an attendant, some others merit recollection: as, for instance, hæmoptysis; different kinds of catarrh; gout; severe erysipelas; violent continued fevers; and bad local injuries and important surgical operations.]

* The progress of pneumonia to a fatal result is marked by a continued aggravation of the dyspnœa, with increasing failure of the strength. The cough becomes less capable of expectorating the sputa, which sometimes retain their viscidity and sanguinolent hue, as long as any are avoided. In the greater number of instances, there is a total suppression of the expectoration for some hours before death; but, in others, it is still excreted, though of a different character. The whole sputa, however, in the latter stages of the disease, are generally scanty. Andral describes sputa as sometimes taking place, which consist of a slightly glutinous liquid, and of a reddish-brown colour, resembling liquorice-water, or thin sirup of prunes. Towards the concluding scene, the pulse becomes thready and intermittent; the countenance pallid, cadaverous, and bedewed with a cold sweat; the lips livid, the breathing gasping and convulsive, with a rattle in the throat; the sensorial functions, if entire before, now give way; and the patient dies asphyxiated. Whoever has seen the fatal end of pneumonia, must recognise the fidelity of this description, as given by Dr. C. Williams in *the Cyclop.* of Pract. Med., art. Pneumonia.—Ed.

The malignant peripneumony, contrary to the true or common inflammatory affection, is generally an epidemic, and may be easiest explained by describing it as an epidemic synochus, or typhus, occurring in such situations, at such seasons of the year, or in such a temperament of the atmosphere, as have a tendency to excite inflammation of the lungs. The debility is often so extreme from an early stage of the disease, that the pulse ceases on the pressure of the finger; and the vascular action is too weak to accomplish expectoration. It is supposed by many writers, and especially by Sarcone and Ludwig, to be a pulmonic erysipelas, by which they mean an erysipelatous erythema. The symptoms are those already described, with a great addition of sensorial debility, and consequently with increased laboriousness of respiration. The disease is usually fatal on the fourth or fifth day; and if the system be incautiously lowered by venesection or a laxative of too much power, it often takes place earlier; and has sometimes occurred within twenty-four hours after bleeding.*

Our attention must here, therefore, be turned rather to the constitutional disease, than to the local affection; and the plan recommended in typhus is to be pursued on the present occasion: for it will be in vain to attempt expectoration under circumstances in which the system will probably sink before the usual time arrives for effecting it. Camphire is here a medicine of considerable service, and may be used in conjunction with the aromatic confection, and wine in large quantities. It should be taken freely in the form of pills, rather than in that of julap; though both may be employed conjointly. Even the bark has a powerful claim to be tried, particularly the sulphate of quinine, as in putrid fever; nor has it been found to produce difficulty of breathing. Bark may be advantageously combined with the aromatic spirit of ammonia, which of itself often proves a useful stimulus. If evacuations be necessary, they should be obtained by injections alone. A light breathing perspiration, a free expuition, and a more animated appearance of the countenance, are among the most favourable diagnostics.*

* Perhaps there is no part of the "Study of Medicine" more appropriate than the present, to notice a form of disease which at times has prevailed in different and distant sections of the United States with extraordinary fatality. This disorder has been termed the *petechial*, or *spotted fever*, the *malignant nervous fever*, *peripneumonia typhoides*, the *malignant pleurisy*, *pleurisy of the head*, *typhus gravior*, *typhus gravissimus*, *typhus gravissimus cerebralis*, *typhus gravissimus pectoralis*, *epidemic pneumonia*, &c. Though it was first particularly noticed some twenty years since, some authorities state that it was described by Sauvages, Huxham, and others. Dr. Gallup, indeed, thinks that a similar disorder has raged at different times in Europe for the last three hundred years. In the Am. Med. and Phil. Register, vol. i., Dr. Bard has described it as it prevailed on Long Island in 1749; and in the New-York Med. Repos., vol. ii., Dr. H. Williamson has noticed its occurrence in North Carolina in 1792. In 1806, the spotted fever appeared at Medfield, and for many years it proved a severe scourge to the inhabitants of Maine, Massachusetts, Rhode Island,

The SPURIOUS OR BASTARD PERIPNEUMONY is usually allowed to offer another variety of this disease; and is described under the name of *peripneumonia notha* by Boerhaave, Coze, and Sydenham. It is, in many instances, little more than a severe catarrhal affection of the lungs, accompanied with great obstruction, occurring in habits of a peculiar kind; and is hence denominated by many authors *catarrhus suffocativus*, and by Professor Frank, catarrhus *bronchiorum*.—(*De Cur. Hom. Morb.*, tom. ii., p. 138.) It is characterized by great secretion and expectoration, with a mild cauma; and is chiefly found in those of advanced life, or who have weakened their constitution by excesses.

Sydenham, however, has properly distinguished this malady from catarrh, notwithstanding the close resemblance it bears to it on particular occasions. The following is his description of the disease:—"The patient is hot and cold alternately, feels giddy, and complains of an acute pain in the head, especially when there is a teazing cough. He rejects all fluids, sometimes from paroxysms of coughing, and sometimes without; the urine is turbid, and of a deep red; the blood appears as in pleurisy. The patient breathes quick and with difficulty; complains of a general pain throughout the entire breast, and, as he coughs, discovers a wheezing to the attendants. The cheeks and eyes appear slightly inflamed; the pulse is small, often intermitting; and lying low, or on one side, is peculiarly distressing."

As the fever is here of no great moment, we may, with considerable advantage, carry our local stimulants to a greater extent, and thus excite the lungs more actively to throw off the burden of mucus with which they are overpowered. Squills, gum-ammoniac, balsam of Peru, and even some of the turpentines, may be tried, and will mostly be found serviceable. The tetradynamia, as charlock, wild rocket, and mustards of various sorts, and the alliaceous plants, will form useful auxiliaries in the plan of diet. Blistering is highly serviceable; after which, as soon as the chest is a little unloaded, a regimen directly tonic should be commenced, by means of bitters, chalybeate waters, a moderate portion of wine, gentle exercise, pure air, and the irritation of an issue or seton; for a common result of this disease is hydrothorax. Perhaps more persons fall a sacrifice to some sequel of the disease than to the disease itself.

Connecticut, Vermont, New-Hampshire, and some districts of New-York. It has also existed in some of the middle, southern, and western states, but our information as to its nature in these states is extremely limited. We would refer those who desire more knowledge of this malady than can be embraced in a brief note, to the treatises of Drs. North, Hale, and Job Wilson on the Spotted Fever, and to Dr. Yates' essay on the Bilious Epid. Fever. The American medical periodicals contain many excellent papers on the same subject, by Stuart, Hosack, Low, Fuller, Stearnes, Hudson, Dunbar, Hunt, &c. Dr. Gallup in his "Sketches of Epidemics," Dr. Mann in his "Medical Sketches," and Dr. Thacher in his "American Modern Practice," devote some pages to it. The best article, however, on this disease, is the Report made by order of the Mass. Med. Society, in 1810, drawn up by Drs. Warren, Jackson, and Welsh. The invasion of the disease was generally sudden and violent, presenting many of the symptoms mentioned in the text, although they varied excessively, and were so different in individual cases as not to admit of enumeration; at times, it was marked with greater depression, and assumed more of a typhoid type; the patient often laboured under extreme congestion and coma; maculæ, vibices, &c., occasionally appeared. As to the treatment, the most opposite modes of practice prevailed; in many cases the lancet was fatal, and the same was true of the administration of diffusible stimuli: emetics, cathartics, sudorifics, blisters, &c., were among the most effectual remedies. Bloodletting, although sometimes abused, was often indispensable; in short, the spotted fever frequently presented two entirely different forms, demanding different modes of treatment; a local inflammation, and a typhoid state of the system.

On dissection, the brain was almost constantly diseased, and in most instances there was an effusion of serous fluid, and of coagulated lymph within the ventricles. The heart and pericardium generally exhibited some appearance of morbid affection, and the same remark applies to the pleura and lungs.

By many, the causes of this disease were thought to be the vicissitudes of pestilential seasons; and, inasmuch as the disease proved extremely fatal to the American soldiers, in the war of 1812-14, its exciting cause was considered by others to be the unwholesome grain used by the soldiers, and the exposure incident to military life. Both these causes doubtless operated, but the extreme changes in the temperature probably had more effect.—D.

SPECIES VIII.

EMPRESMA PLEURITIS.

PLEURISY.

ACUTE PAIN IN THE CHEST, INCREASED DURING INSPIRATION; DIFFICULTY OF LYING ON ONE SIDE; PULSE HARD; SHORT, DRY, DISTRESSING COUGH.

As the proper seat of the preceding species is in the substance of the lungs, or the pleuritic membrane that immediately covers their surface, or in both, the proper seat of the present is in the surrounding membranes of the pleura; and as these differ, the difference has laid some foundation for several varieties; of which the three following may be noticed as matter of curiosity, though the subdivisions lead to nothing of practical importance, as the causes are nearly alike, and the same mode of treatment is applicable to the whole.

a Vera. True Pleurisy.	Fever a cauma; pain felt chiefly on one side; the inflammation commencing in that part of the pleura which lines the ribs.
β Mediastina. Pleurisy of the mediastinum.	Heavy pain in the middle of the sternum, descending towards its ensiform cartilage; with great anxiety; the inflammation, from its symptoms, being obviously seated in the mediastinum.

γ Diaphragmatica. Pleurisy of the diaphragm. Painful constriction around the præcordia; small, quick, laborious breathing: manifesting that the inflammation is seated chiefly in the diaphragm.*

We have already pointed out the distinction between true pleurisy and peripneumony; and observed that, in the former, the cough is dry and commonly without expectoration from the beginning to the end, contrary to what occurs in the latter; that the seat of pain is fixed, instead of shifting from side to side; and that the face is far less flushed and tumid. It must be conceded, however, to Dr. Cullen, who has treated of these affections under one common definition, that the general features of the two have a considerable resemblance; and, with the exception of expectorants, which in pleurisy are of little avail, the mode of treatment already proposed for the former disease, is the same that will be found necessary in the latter: the causes of both are alike, and as peripneumony rarely, though we have reason to believe sometimes, occurs without any degree of pleurisy, so it is commonly affirmed that pleurisy rarely occurs without some degree of peripneumony; in both which cases it has been called a pleuro-peripneumonia.

[With all the best informed practitioners of the present day, *pleurisy* always signifies inflammation of the pleura, whether attended with stitch, or pain in the side, or not; *peripneumony*, *pneumonia*, or *pneumonitis*, will always stand for inflammation of the lungs, even when accompanied, as it sometimes is, with acute pain in the side; while *pleuropneumonia* will mean the co-existence of inflammation in both organs. The observations of Laennec fully confirm the facts, that pleurisy and peripneumony are very frequently combined; that, in cases where the pleura alone is inflamed, the stitch of the side may be scarcely perceptible, quite transient, or entirely wanting; and, on the other hand, that a violent peripneumony, complicated with a slight pleurisy, may be attended with a most severe pain in the side.† The latter symptom is, therefore, not pathognomonic of pleuritis. Sometimes, though seldom, the pleura is inflamed on both sides of the chest, so as to constitute what has been termed *double pleurisy*.‡ It is indeed, as Laennec states, not uncommon to meet with slight degrees of pleurisy on both sides of the chest, produced a few hours before death in several acute and chronic diseases; or with a similar affection that has occurred on one side in the last hours of life, while the other side is violently inflamed. But it is extremely rare to see the pleura of both sides simultaneously attacked with violent inflammation and abundant effusion; and, when such a case does occur, it is almost always speedily fatal.]

Like peripneumony, we also find pleurisy an occasional symptom or result of typhus, catarrh, rheumatism, various exanthems, and hypertrophy or enlargement of the heart.—(*Original Cases, &c., by John Forbes, M.D.*, p. 222, 8vo., 1824.) The pleurisy, however, that is supposed to accompany rheumatism, is often an inflammatory affection of the intercostal or other thoracic muscles alone, since the pain is confined to the origin and insertion of the muscles. Where this has been accurately attended to, it has been distinguished by the name of *bastard pleurisy*; and simply by that of *pleuritis* by Dr. Frank (Op. cit., tom. ii., p. 126), and those who have regarded genuine pleurisy as a mere modification of pneumonitis, or peripneumonia.

Like the preceding species, true pleurisy commences with the usual signs of a febrile attack, as chilliness or shivering, succeeded by heat and restlessness. The pain, or stitch in the side, is usually just above the short ribs, and the dyspnœa is characterized by the expirations being less painful than the inspirations.* The pulse is hard, strong, and frequent; and though the cough is mostly dry and suppressed, there is sometimes a bloody or puriform mucus spit up from the lungs. The patient generally lies most easily on the affected side, or the back, and cannot turn on the opposite side without a great increase of the difficulty of breathing.† [As soon as effusion takes place, the natural sound of the chest on percussion is lost over the whole space occupied by the fluid; and, with the stethoscope, a total absence or great diminution of the respiratory sound, and the appearance, disappearance, and return of ægophonism will be detected. When the effusion is considerable, the respiration usually becomes *puerile* on the sound side, and the diseased side is larger than the other.]

* Instead of this division, the editor would have preferred that into acute and chronic pleuritis.

† Laennec, Op. cit., p. 420. Pneumonia is alleged more frequently to produce pleurisy, than pleurisy pneumonia.—Dr. Law, in Cyclop. of Pract. Med., art. Pleurisy.

‡ Pleurisy of one side, as Dr. Law observes (Cyclop. of Pract. Med., art. Pleurisy), is not unfrequently complicated with some disease of the opposite lung, which may either become emphysematous, or the subject of bronchitis, or pneumonia. Another frequent complication of *pleurisy* is tubercles of the lungs.—Ed.

* The pain, which is acute and severe, is usually restricted to a circumscribed space; and is considerably increased by any attempt to make a full inspiration. In truth, the respiration is quickened in pleurisy to compensate for the small quantity of air that can be inhaled on each imperfect expansion of the chest. The pain is not augmented by slight pressure, though it is so by strong. At all events, as Dr. Elliotson remarks, the pleurisy must be very severe, if the pain be increased by slight pressure. On the other hand, in rheumatism of the muscles of the chest, the least touch causes pain and soreness. It is also remarked by Dr. Elliotson, that, for the most part, there is profuse sweating in acute rheumatism, such as does not occur in pleuritis. In the latter, the constitution is more disturbed, but the pain is less excruciating than in acute rheumatism.—Ed.

† The best medical writers contradict one another in their statements about the position in which a patient, labouring under pleurisy, finds himself most easy. The truth is, that some differ

Like the preceding species, also, pleurisy terminates in resolution, suppuration, and gangrene. The former is the ordinary and most favourable issue. The last occurs rarely, and Laennec has seen only one instance of it from acute inflammation; but suppuration is by no means uncommon; in which case, if the abscess do not point outwardly, an empyema will necessarily follow; and the formation of pus is indicated by a remission of the pain, one or more shivering fits, and, in some instances, a sense of fluctuation. This, however, is a termination far more common to pleurisy from external injuries, than from internal causes.

[The pleura, when acutely inflamed, exhibits a punctuated redness, or an infinity of small bloody spots of very irregular figure. They occupy the whole thickness of the membrane, and leave small intermediate portions retaining the natural white colour. It cannot be doubted (says Laennec), that, during life, the redness was uniform; and that the punctuated appearance and partial whiteness are owing to changes which occur after death. Besides this particular redness, the superficial bloodvessels of the pleura are always redder and more distended than in the natural state. Many consider a thickening of the pleura a very common result of its inflammation; but Laennec thinks that, in most cases, where such thickening has been supposed to exist, the appearance was produced by an extensive congeries of miliary tubercles on the outer or inner surface of the pleura, a cartilaginous incrustation on the parts covered by it, or a layer of coagulating lymph on its internal surface. Inflammation of the pleura, he says, is always accompanied by an extravasation on its internal surface; the matter effused being either coagulating lymph, termed a *false membrane*, or else serosity, or a sero-purulent fluid. The serous effusion is commonly of a light yellow colour and transparent, or with its transparency only slightly interrupted by the intermixture of small fragments of pus or lymph, so as to give it the appearance of unstrained whey. In acute pleurisy, it is mostly free from smell. Generally speaking, the more violent the inflammation, the more extensive and thick is the membranous exudation, or layer of coagulating lymph. On the contrary, in weak leucophlegmatic subjects, we find a great quantity of limpid serum, with a small portion of thin membrane often floating in it. In such cases the pleurisy seems to pass insensibly into hydrothorax. In some rare instances we find a pseudo-membranous exudation, uniting the contiguous surfaces of the pleura, without any serous effusion. This, as Laennec observes, would be a very common case, if we took into our account those pleurisies which had made some progress towards a cure, the absorption of the fluid being the first step in the sanative process. But the less common examples to which he alludes above are noticed in persons dying of some other disease, and who were at the same time affected with a slight and partial pleurisy. In these cases we find a white, almost colourless, semi-transparent exudation, which, while recent, readily allows the parts to be separated, and remains on the surface of each, exactly like a thick and moist paste, which had united two leaves of paper.

The pleura pulmonalis near the inflamed part is also sometimes covered to a small extent with a layer of lymph of various consistence and thickness. In some cases, we find no serous effusion after death; and Laennec has met with similar examples of partial pleurisy, in which no extravasated fluid could be perceived with the stethoscope.

Many physicians imagine that the effusion does not occur till after some time, and even some days. This opinion is pronounced by Laennec to be incorrect. He has several times observed all the physical signs of effusion, viz., ægophonism, and absence of the respiration and sound on percussion, in one hour from the first invasion of the disease, and he has seen the side manifestly dilated at the end of three hours.

The false membrane, or exudation of lymph, is gradually changed into cellular substance, or rather into a true serous tissue, like that of the pleura. The serous effusion is absorbed, the compressed lung expands, and the false membrane investing it and the costal pleura becomes united into one substance, which afterward becomes vascular and organized, and constitutes permanent adhesions. A severe pleurisy, that has terminated by numerous adhesions, renders the part so affected much less liable to subsequent attacks of the same disease; and when it occurs, the inflammation and effusion do not extend to the adherent parts.

When pleurisy is simple, the pulmonary tissue is free from inflammation, even in the vicinity of the inflamed portions of the pleura; but it is rendered more dense and less crepitous from the compression of the effused fluid. If the extravasation has been very great, the lung becomes flattened and completely flaccid; it no longer contains air, or crepitates; its vessels are compressed, and contain little blood; and the bronchiæ are rendered smaller. Yet there is no trace of obstruction, as in pneumonitis; and if air is blown into the bronchiæ, the lungs expand.—(*Laennec*, op. cit., p. 421, et seq.) When the effused fluid is tinged with blood, or, what is rare, contains coagula (see *Case recorded by Andral, Clinique, Med.*, tom. ii., obs. 15), Laennec terms the disorder *acute hemorrhagic pleurisy*.

ence prevails in different cases. Dr. Law gives it as the result of his observations, that, generally, as long as the acute lancinating pain of the side continues, the aggravation of it, caused by the pressure, makes the patient put himself either on the opposite side or upon his back. When the pain has ceased, and extensive effusion takes place, the position before avoided is now adopted; because, the effusion having interrupted the function of one lung, a necessity for greatly augmented action devolves upon the other; and in order to favour this, and to let the muscles have the freest action on the unaffected side of the chest, the patient lies on the diseased side.—See Cyclop. of Pract. Med., art. Pleurisy.

Among the occasional causes of pleurisy enumerated by Laennec are, inclemency of the winter; long exposure to cold after violent exercise; metastasis of gout, rheumatism, and cutaneous diseases; blows on the chest; and fracture of the ribs. One of the chief dangers of penetrating wounds of the chest, is inflammation of the pleura or lungs. Dr. Law has seen a fatal case of pleurisy produced by perforation of the pleura, in passing the needle round the subclavian artery for the cure of an axillary aneurism.—(*Cyclop. of Pract. Med., art.* Pleurisy.) Among predisposing causes are, a slender frame, narrowness of the chest, the immoderate use of spirits, and tubercles in the lungs. In youth and middle life, plethora, violent exercise, intemperance, and cold, frequently bring on pleurisy; but in old persons, and subjects of delicate constitution, who take great care of themselves, it is still more frequent. The worst cases, as Laennec truly remarks, occur in the weakest subjects, and in cachectic habits.—(Op. cit., p. 445, 2d edit.)]

Perhaps there is no disease in which profuse bleeding from a large orifice may be so fully depended upon, or has been so generally acceded to by practitioners of all ages and all nations; the only question which has ever arisen upon the subject being, whether the blood should be taken from the side affected, or from the opposite. The earlier Greeks recommended the former, the Galenists and Arabians the latter; and the dispute at one time rose so high, that the medical colleges themselves not being able to determine the point, the authority of the emperor Charles IX. was whimsically appealed to; who, with much confusion to the controversy, died himself of a pleurisy before he had delivered his judgment. He, too, had been bled, and his death was immediately ascribed to the blood having been drawn from the wrong side. At present, from a knowledge of the circulation of the blood, we can smile at these nugatory solemnities. It is possible, however, that there are some controversies of our own times that have as little groundwork, and at which future ages may smile with as much reason. The blood drawn in this disease has a peculiarly thick, yellowish, tenacious corium, and is hence specifically distinguished by the name of the pleuritic corium or coagulum.

[Should the pain and fever not yield to the first or second venesection, Laennec very properly recommends it to be followed up by local bleeding, preferring, however, cupping to leeches. As Dr. J. Forbes judiciously observes, one of the many practical advantages of accurate diagnosis in pleurisy and peripneumony is, the much greater benefit derived from local bleeding in the former than in the latter disease. He believes we are accustomed to trust too much to general, and too little to local bleeding in this disease, and that both, combined in moderation, are greatly preferable to either in excess.—(See *note in Laennec*, p. 479, 2d edit.)]

Purgatives should be used freely; blistering the side is very generally beneficial after bleeding has been tried and repeated, and should be accompanied with diluents and diaphoretics. [Blisters should not be applied in too early a stage, as they are then apt to increase the fever and pleuritic affection. In this disease, as well as in pneumonitis, Laennec prescribes tartarized antimony freely, and states that it speedily subdues the inflammatory action, and obviates the necessity of abstracting profuse quantities of blood.] Opium may also be employed with less caution than in peripneumony, and is a most valuable medicine, joined with calomel, as recommended by Dr. R. Hamilton.* For promoting the absorption of the effused fluid, the latter medicines, acetate of potass, digitalis, with mercurial inunction, and blisters, are the best means. When the accumulation increases so as to form dropsy, paracentesis of the chest may become necessary.†

The heart and pericardium are sometimes apt to associate in the morbid action, as well as the lungs themselves. This is particularly the case in the second variety. Dr. Perceval, in his manuscript commentary on the Nosology, has given me a striking example of this, in a

* Dr. Elliotson enumerates bleeding, *mercury*, starvation, and purging, among the remedies indicated for the relief of this as well as other inflammations. Mercury is now, indeed, universally acknowledged to be one of the most powerful means of subduing inflammation of the serous membranes in general.—Ed.

† Sometimes the affected side of the chest seems more expanded than the other; and if the effusion be in the left pleura, the heart may be so displaced, that it pulsates to the left of the sternum. An accumulation of fluid in the right pleura may push down the liver in an extraordinary manner, so as to cause an appearance in the abdomen, as if that viscus were enormously enlarged, whereas there may not be the slightest disease of it; a mistake which often took place before auscultation began to be employed, but which, with the valuable aid of the stethoscope and percussion, will hardly happen again. The want of a hollow sound on percussion, even without ægophonism, which prevails only while the quantity of fluid is moderate (see Elliotson's Lectures), will, with attention to the history of the case, render the diagnosis of fluid in the chest sufficiently clear. When effusion takes place, there is a dead sound on percussion, and no respiratory murmur is heard. Dr. Elliotson observes, that the part of the chest where we should first listen for ægophonism, is from about one to three fingers' breadth from the lower angle of the scapula to the nipple, because it is *below* this point that the fluid generally accumulates; and, if the whole lung be covered with effusion, still the thickness of the body of the fluid is always less at the posterior part of the chest. If the lung has been so compressed that it will not expand, and the fluid has been absorbed or let out, and no more has formed, the ribs on that side fall, and lie closer together than natural; the shoulder on that side becomes lower than the other; and the muscles, especially the pectoral, waste. Even the spinal column at length inclines, in some cases, to the affected side. These circumstances were first well described by the celebrated Laennec. Dr. Elliotson, in his Lectures, gives an excellent account of them, with the particulars of a case, in which a chronic pleuritis, terminating in such changes, had been mistaken for phthisis cured by means of muriate of lime.—Ed.

patient who complained of excruciating pain in the region of the heart, with dyspnœa, not at all relieved by copious and repeated bleedings. After death, a slight effusion was discovered in the pericardium: but the mediastinum was more inflamed than the membrane of the heart. The treatment of this variety ought not to differ from that of the preceding.

The cerebrum is, however, still more disposed to associate in the morbid chain of action than the heart. And hence, when any of the varieties of pleuritis, and particularly the last, are combined with an affection of this organ, and produce delirium, the disorder was formerly distinguished by the terms paraphrenesis and paraphrenitis; terms derived apparently from the peripatetic philosophy, which supposed the seat of the φρὴν, or soul, to be the præcordia; whence this region was denominated φρένες; while, as Hippocrates supposed its seat to be in the brain, phrenitis, with a lamentable confusion of terms, was, as we have already remarked, applied to an inflammation of this last organ, and continues to be very generally so applied in the present day.

It is in the LAST VARIETY that the head is most commonly affected: probably from the general sympathy which the diaphragm holds with the lungs and the stomach, and the close community of action between both these organs and the brain. The breathing is here peculiarly distressing and anxious, the diaphragm being the muscle chiefly concerned in respiration, which now takes place without its aid. The hypochondria are drawn inwards, and kept at rest as much as possible: the patient is tormented with hiccough and sickness; and there is a peculiar tendency to spasmodic action; whence the angles of the mouth are often involuntarily retracted: there is a sardonic laugh on the countenance, a sense of tightness like the stricture of a cord at the præcordia, and convulsions wander from one part of the system to another. Professor Frank mentions a case in which all these symptoms were present, and which was consequently supposed to be, and was treated as, a diaphragmatic pleurisy, but which on dissection (for it proved fatal) was ascertained to be a case of intestinal worms, the diaphragm showing no manifest affection. It is highly probable, however, that the diaphragm was here influenced by sympathy, and that the distinctive symptoms were the result of such irritation. The treatment should be as in the preceding varieties.

SPECIES IX.

EMPRESMA CARDITIS.

INFLAMMATION OF THE HEART.

PAIN IN THE REGION OF THE HEART, OFTEN PUNGENT ANXIETY; PALPITATION; IRREGULAR PULSE.

THE symptoms in the definition sufficiently distinguish this species from the preceding. At the same time, it must be acknowledged, that carditis, like pleuritis, has many signs in common with pneumonitis; which may readily be conceived from the vicinity and close connexion of the thoracic viscera with each other, and particularly from the very strong sympathy with which they co-operate. Dr. Cullen affirms, indeed, that he has often met with cases of carditis evincing no other symptoms than those of pneumonitis, and Dr. Frank concurs in the same testimony. Vogel's definition is founded altogether upon this view, "Cordis inflammatio ferè ut in peripneumonia.". I have hence been at some pains to draw a line of distinction; and I think it may be found in the symptoms now delivered as the specific character of the disease. We may add to these symptoms, that there is sometimes, though not always, great difficulty of breathing, generally some degree of cough, but without expectoration, and a perpetual tendency to fainting; and that if deliquium take place, and the patient do not soon recover from it, it proves fatal.* Portal asserts, that the organic pain is accompanied with an increase of heat, which often spreads to the surrounding regions. This is Portal's *acute* modification of the disease: but he also notices an *obscure* or latent modification, in which its symptoms are but little conspicuous, and whatever exists of them are ascribed to some other disease. The spirit, he tells us, is here suddenly subdued and broken; the pulse is slow, soft, and feeble: there is little pain in the heart, and little or no palpitation. Fainting, nevertheless, is a frequent appendage, and is peculiarly apt to lead astray. This, however, can hardly be called an idiopathic disease. Portal has drawn his description entirely from post-obit appearances in those who have died of severe atonic typhus, or of plague; and observing, as Chicoyneau had before him, occasional proofs of suppuration and gangrene of the heart, he has inferred the previous existence of carditis, and has ascribed the almost instantaneous sinking of the patient to a rapid march of inflammation in this organ, notwithstanding it was not manifestly accompanied with its ordinary indications.†

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* Abercrombie, Contributions to the Pathology of the Heart.—Trans. of the Medico-Chir. Soc. of Edin., vol. i., 1824.

† Mémoires sur la Nature et le Traitement de plusieurs Maladies, par A. Portal, tom. 4me., 8vo., Paris, 1819. One case, the fatal result of which had been preceded by several of the symptoms frequently noticed in pericarditis, was opened by Andral. The following is a sketch of the disorder:—In the midst of a good state of health, sudden dyspnœa; pain not very acute about the heart; tumultuous beatings of this organ; very frequent, irregular pulse; increasing suffocation, and death. Nothing wrong was detected about the pericardium and substance of the heart, its auriculo-ventricular openings, the mouths of the great arteries, or its vessels; *but the internal surface of its left cavities were of a bright red colour.* No other morbid changes. In another example, where the patient was seized with pleurisy, and died, after having suffered for three weeks pain about the heart, dyspnœa, and palpitations, and where each contraction of the ventricles was for-

[The obscurity in the diagnosis of pericarditis is still generally acknowledged. Dr. Ribes continues to assert, that it has no group of distinguishing symptoms. Sometimes, their assemblage would lead one to suspect an extravasation in the pericardium, and dissection afterward reveals only a partial pleurisy, with matter effused exclusively in the pleura.—(*Andral, Clinique Médicale*, tom. ii., p. 483.) Sometimes great dyspnœa, augmenting until death, with a regular pulse, and without pain, shall be the only sign of an affection of the pericardium, with fluid effused in its cavity.—(Id., tom. iii., p. 438.) In another instance, where a tuberculated state of the lungs is ascertained, and yet the respiration is little oppressed, a severe dyspnœa suddenly comes on, and proves rapidly fatal; dissection disclosing a purulent collection in the pericardium.—(Ibid., Case following that last cited; see *Andral*, tom. iii., obs. 9.) There has been no pain; but aneurismal symptoms have occurred, which the post-obituary examination has not explained the cause of. Such is the influence of disease of the pericardium over the organ which it encloses, that it has occasioned appearances of complaints which had no existence; and the symptoms of chronic inflammation of the membrane may assume a form resembling that of organic disease of the heart. On other occasions, palpitations are the main effects, and the other local symptoms afford no information. In Andral's twelfth case, there was pain at the bottom of the sternum, and in the region of the heart; obscurity in the pulsations of this organ; but strength and regularity in the pulse: dissection showed a stratum of coagulating lymph in the pericardium. Several times in the course of the disease, the dyspnœa and general anxiety subsided with the pain.*

No modern pathologist has investigated the characteristic symptoms of pericarditis with greater discrimination than M. Louis. The cases which he witnessed and verified by dissection show, that the symptoms most to be depended upon are, *a more or less acute pain in the præcordia, taking place suddenly; accompanied with oppression and palpitations in a greater or less degree; irregularity, or intermissions of the pulse, sooner or later followed by an obscure, dull sound in the region of the heart on percussion, while the rest of the chest yields a clear resonation.* When all these symptoms are combined in a person previously well, the existence of pericarditis may be inferred. If the pain were absent, and the other symptoms occurred, the diagnosis, according to M. Louis, would be hardly less clear; for the only doubt would be between pericarditis and hydrops pericardii, and this last disease is formed less quickly, and without all the series of symptoms above detailed. In a chronic case, more difficulty would be experienced.*

The anasarca and coldness of the lower extremities, in cases recorded by M. Louis, approximate them to other affections of the heart, and make an additional line of division between this disease and those of other organs.†]

In carditis, adhesions have been occasionally found to a very considerable extent between the heart and pericardium, even where little inconvenience had been felt during life; from which we may, at least, collect, that the extent of motion of these two parts on each other is not very great. A purulent kind of fluid has at times also been detected on the outer surface of the heart, without the slightest appearance of ulceration either of the heart or pericardium; and, as the same sort of secretion has often been traced, without ulceration, in other cavi-

lowed by a dull, grating sound, Andral found no lesion, but a *vivid red colour of the valves of the aorta*, the texture of which was thickened. In certain cases of organic disease of the heart, where great redness of the whole of this organ, or parts of it, is found after death, not ascribable to putrefaction, and where the patients are suddenly seized with alarming symptoms, connected with exasperation of the disease of the heart, and die in the midst of these aggravated symptoms, Andral suspects that the catastrophe is referrible to the organic disease becoming complicated with acute inflammation.—See Clinique Médicale; and Anat. Pathol., tom. ii., p. 279.—ED.

* F. Ribes, de l'Anatomie Pathologique, considérée dans ses vrais Rapports avec la Science des Maladies, tom. i., p. 88, Paris, 1828.

* Dr. Latham mentions two cases, which were supposed to be marked inflammation of the brain; yet this organ was found, after death, perfectly sound in each example, and the heart affected with intense pericarditis.—(Med. Gaz., vol. iii., p. 209.) Andral relates a similar case.—(Clinique Méd., tom. iii., p. 444.) Cases so anomalous as these Dr. Hope considers rare. The principal symptoms of pericarditis, enumerated by the latter physician, are, acute inflammatory fever; a pungent, burning, lancinating pain in the region of the heart, shooting to the left scapula, shoulder, and upper arm, but rarely descending below the elbow, or even quite to it. The pain is increased by full inspiration, and especially by pressure between the præcordial ribs, and by forcing the epigastrium upwards, underneath the left hypochondrium; inability of lying on the left side; dry cough; hurried respiration; palpitation of the heart, the impulse of which is sometimes violent, bounding, and regular, though its beats may be unequal in strength; at other times its action is feeble, fluttering, and irregular; pulse always frequent, and generally at first full, hard, jerking, and often with a thrill; dyspnœa; a constrained position, any deviation from which brings on a feeling of suffocation; extreme anxiety; constant jactitation, &c. As many of these symptoms attend other complaints, it must be confessed that they would leave the diagnosis obscure.—ED.

† P. C. Louis, Mém. Anat. Pathologique, p. 274, Paris, 1826. The observations on pericarditis in this work are highly important. Dr. Elliotson, in describing a case of dilatation and attenuation of the ventricles, and disease of the aortic valves, as proved by dissection, mentions that the symptoms were, universal dropsy; difficulty of breathing; loud action of the ventricles, and a bellows sound at the apex of the heart. These things, he says, frequently occur in persons under thirty, and *they also generally occur in consequence of pericarditis, and pericarditis as the result or attendant of rheumatism.*—See Clin. Lect., Lancet, 1830-31, p. 488.—ED.

ties, Mr. Hewson, as we have already seen, first suspected, and Mr. Hunter afterward endeavoured to establish, that this fluid is nothing more than coagulable lymph thrown forth from the vasa vasorum, but changed in its nature in consequence of passing through vessels in a state of inflammatory action. And it was this discovery, and the hint thus founded upon it, that gave rise to the doctrine now so generally admitted, and apparently so well sustained, of a distinct secretion of pus, in many cases, without ulceration.*

The causes of carditis are often obscure: where we can trace them, they are for the most part those of pneumonitis; and the mode of treatment needs not essential vary. Dr. Frank gives an interesting case of violent carditis, brought on by terror in a prisoner condemned capitally. The inflammation proved fatal; but, on dissection, was found not to be confined to the heart.

[Inflammation of the heart appears to be a rare affection,† and, as Laennec remarks, it is consequently very imperfectly known, both in a practical and pathological view. Our author enumerates merely some of the symptoms of pneumonitis, or pleurisy, joined with palpitation, irregularity of pulse, and tendency to fainting. Yet these characters can hardly be received as pathognomonic; because, as Senac observes, (*Traité du Cœur*, tom. ii., ch. vii.), they are extremely uncertain; and, with respect to palpitation, although its presence may lead us to suspect that the heart is affected, yet it is probably only a hypothetical opinion, since, in that inflammation which arises from wounds of the heart, palpitation does not occur. What Corvisart describes as inflammation of the heart, seems to Laennec to have been in reality pericarditis, conjoined with a paleness, and sometimes also with softness of the substance of the heart.—(*Laennec*, Op. cit., p. 621.) Indeed, as Dr. J. Forbes remarks, carditis, properly so called, has been almost universally confounded with pericarditis. He has never seen an unequivocal case of inflammation of the muscular substance of the heart. Yet he has no doubt of its occasional existence, from the statements of Dr. Baillie, and from ulcers and abscesses having been met with in that substance.*

There seems sometimes to be an increase in the action of the vessels of the heart, which, though short of inflammation, is sufficient to give thickness to its walls, and considerable magnitude to its general substance: and hence, a frequent origin of enlargement of the heart. M. Bayle has published an interesting case, which appears to belong to this kind of morbid structure. The patient was a young man of delicate constitution and limited intellect. He was attacked in 1819 with mental derangement; and, in a few months afterward, seemed to labour under a general oppression in every organ, under which he died in a few days. The membranes of the brain were infiltrated and thickened; the heart was twice and a half its natural size; the aorta and pulmonary artery, as well as various other vessels, gave evident proof of a direct inflammatory action.—(*Obs. d'Artérite*, *Bibliothèque Médicale*, Sept., 1821.)

There is often a slow or chronic inflammation subsisting in a portion of the heart, which does not betray itself by any peculiar symptom; for abscesses in the substance of the ventricles, and ulcers on the external surface, are occasionally found after death, without any symp-

* In the bodies of persons who died of pericarditis, Laennec frequently found the heart softened, and of a very pale colour, which he compared to that of a dead leaf. According to Andral, there is, in such cases, rather a flaccidity of the heart than a true softening of it.—(Anat. Pathol., tom. ii., p. 300.) Dr. Elliotson has given some interesting particulars of an instance of pericarditis, joined with hypertrophy of the left ventricle. The symptoms were, dyspnœa; violent and extensive palpitation; beatings of the heart, 160 in a minute; violent pain about this organ, darting to the clavicle and shoulder, and back to the scapula; extreme tenderness on pressure over the heart. The impulse and sound of the heart's action were perceived very extensively over the chest. The sound, which was that of the bellows kind, occurred with the pulse at the wrist, when the heart struck the side. The pulse was often irregular, very small, and at times hardly distinguishable; a symptom alleged by Dr. Elliotson to be common in pericarditis. There was a great and extensive dulness of sound on percussion over the cardiac region, which did not arise in this case from effusion in the pericardium. There was also great cough without expectoration; the legs were anasarcous, and the belly dropsical. The patient was bled in the arm, cupped freely, and put under the influence of mercury. Some relief followed; yet the heart yielded the same sound, and the signs of hypertrophy, and dilatation, and obstruction, as before. As the patient was getting up to take some food, he suddenly expired. On dissection, hypertrophy and dilatation of the left ventricle, and universal adhesions of the pericardium to the heart were noticed, some of which were ancient, others recent. The neighbouring pleura had suffered, and bands were seen between the lungs and pericardium, and lungs and costal pleura.—See Clinical Lectures, in Lancet for 1830-31, p. 427.—ED.

† The redness of the substance or lining of the heart, frequently observed in the dissection of bodies more than twenty-four or thirty hours after death, in warm or damp weather, is not an indication of carditis, but merely a change that has followed dissolution.—(See Andral, Anat. Pathol., tom. ii., p. 276.) In animals poisoned by the oxymuriate of mercury, the lining of the heart is studded with red spots.—ED.

* Of universal carditis, with effusion of pus generally throughout the muscular tissue, Dr. Hope believes (Cyclop. of Pract. Med., art. PERICARDITIS), that there is not more than a single instance on record, and that occurred to Dr. Latham. "The whole heart," says Dr. L., "was deeply tinged with dark-coloured blood, and its substance softened; and here and there, upon the section of both ventricles, innumerable small points of pus oozed from among the muscular fibres. This was the result of a most rapid and acute inflammation, in which death took place after an illness of only two days."—Med. Gaz., vol. iii., p. 118. Portal and Chicoyneau are alleged, however, in the text (see p. 501), to have seen proofs of suppuration and gangrene of the heart.—ED.

toms of previous inflammation.—(*Morgagni*, epist. xxv., art. xvii.; *Bonet*, tom. i., p. 849.)

SPECIES X.

EMPRESMA PERITONITIS.

INFLAMMATION OF THE PERITONEUM.

PAIN AND TENDERNESS OF THE ABDOMEN, ESPECIALLY ON PRESSURE, OR IN AN ERECT POSTURE; WITH LITTLE AFFECTION OF THE SUBJACENT VISCERA, OR ABDOMINAL WALLS.*

The inflammation may be seated in the peritoneal membrane lining the cavity of the abdomen, or in its extension to the mesentery or omentum. And hence Dr. Cullen has noticed the three first following varieties, [to which modern experience has added a fourth]:—

α Propria. Proper inflammation of the peritoneum.	The inflammation taking the general range of the peritoneum; pain extreme, often pungent, with little or no relief from stools.
β Omentalis. Inflammation of the omentum.	With a more sensible swelling in the region of the omentum.
γ Mesenterica. Mesenteric inflammation.	Pain more deeply seated, and more immediately in the mesenteric region; external tenderness less than in the preceding varieties.
Chronica. Chronic peritonitis.	Progress slow and insidious; pulse accelerated; little or no tension of the abdomen; sense of pricking, or slight tenderness in the belly; bowels generally costive, sometimes loose.

* "Pain, tumefaction, and tenderness of the abdomen on pressure, are the most prominent symptoms which characterize this affection during life; and increased vascularity, thickening, effusions of coagulable lymph, of serum, of pus, or blood, are the principal local effects produced by it. These elementary features, accompanied in general with more or less of pyrexia, will exist in different degrees and combinations, in every variety of age, sex, or constitution; modified, however, by circumstances, derived partly from the nature of the cause, and partly from the condition of the patient at the time of the attack. Peritonitis may assume either the acute or chronic form. It may exist as a sporadic disease, or prevail as an epidemic. It either presents itself openly, with a numerous group of well-marked symptoms, or creeps on in a latent state, with scarcely one of its characteristic features. It may be limited in its extent to a small portion of membrane, or spread over a large surface. It may run its course uncombined with any other affection, or be complicated with various diseases. There is no period of life exempt from its attacks, &c.: pursuing the same course, and exhibiting similar effects in all, it yet presents a vast variety of symptoms in individual cases, principally according to the organ whose peritoneal covering is the chief seat of the inflammation."—Dr. MacAdam, in Cyclop. of *Pract. Med.*, art. Peritonitis.—Ed.

It is singular that Dr. Cullen, after distinctly characterizing this species in his Nosology, and following it up into three subdivisions, each of which, with him, forms a separate species, as the general disease does a genus, should take no other notice of the entire complaint in any form, except what is expressed in the following laconic remark:—"Among the inflammations of the abdominal region, I have given a place in our Nosology to the peritonitis; comprehending under that title, not only the inflammations affecting the peritoneum lining the cavity of the abdomen, but also those affecting the extensions of this membrane in the omentum and mesentery. It is not, however, proposed to treat of them here, because it is very difficult to say by what symptoms they are always to be known; and further, because when known, they do not require any remedies besides those of inflammation in general."

This remark is by far too sweeping. If the diseases referred to have no specific symptoms by which they can be known, they have no more claim to be admitted into a system of symptomatic nosology, than into a treatise of practice. Dr. Cullen is right in assigning them a place in the former; and he is, therefore, necessarily wrong in banishing them from the latter; and the more so, as the treatment ought, in some degree, to vary from that of enteritis, to which his general observation seems chiefly to refer.

The true peritonitis occurs, as we have already observed, as a symptom in puerperal fever;* and, as we have treated of it at some length under that disease, it is the less necessary to be minute in our account at present. Puerperal fever, indeed, is sometimes, though not quite correctly, made a variety of peritonitis; for it is a disease of a peculiar kind, produced by peculiar causes, and is only connected with peritonitis as the latter enters as a symptom into its general character, and may hence take the name of *puerperal* peritonitis, to distinguish it from *idiopathic*.

[Acute peritonitis generally begins with chills and shiverings, though these are occasionally slight, and sometimes not at all observable. The pulse becomes quick and frequent; the urine is scanty and high-coloured; there is considerable thirst; and the general affection, called fever, ensues. These symptoms are attended from the very beginning with a sense of heat and pain in the abdomen; at first, generally confined to one part, though sometimes more diffused. This pain is much increased by pressure;† or, in other words, there is a great tenderness or soreness of the belly; but it is not

* From what is stated in the notes upon puerperal fever, the reader will see that peritonitis is not a constant or an essential part of the disorder.—Ed.

† In order to judge whether the tenderness depends upon a real increase of sensibility, the hand should be laid flat on the centre of the abdomen, and then pressed successively on every part of it. Care should be taken not to make pressure with the ends of the fingers; for thus pain may be excited where there is no disease.—Martinet's Pathology, by Quain, 3d ed., p. 68.

accompanied by any inclination to go to stool. The pulse is at least 100 in a minute, and small; yet the tongue is not much altered at first from its natural appearance.

In the course of twenty-four hours, however, the pain and tenderness on pressure increase, so that sometimes even the weight of the bed-clothes becomes intolerable, and the pulse rises to 120 or 130 in a minute. At this time, the tongue begins to be covered with a cream-coloured mucus, and, though it is moist, there is great thirst. A considerable degree of tension and swelling now takes place over the whole abdomen, and the patient finds most relief from pain by remaining motionless upon the back, with the knees in a small degree elevated. Along with these symptoms, you will frequently notice singultus, nausea, and vomiting; at first, of the ordinary contents of the stomach, and afterward of bile; though such gastric disturbance is still more characteristic of enteritis, and may not always accompany simple peritoneal inflammation. The tension of the belly continues to increase to the sixth, seventh, or eighth day; on one of which days, unless proper measures have been taken to remove the disease, the patient most commonly expires. Previously to death, the pain often suddenly ceases, and the change may be mistaken for amendment; but, if the symptoms be minutely examined, the pulse will be found to be sinking and increasing in rapidity; the patient's strength is also sensibly diminished, the countenance collapses, cold clammy sweats break out, the extremities lose their warmth, and, at length, a laborious respiration manifests the concluding struggle of life.

A favourable prognosis, however, is to be deduced from a gradual cessation of the pain, especially when it is accompanied by a diminution of tension and soreness, and when, at the same time, the pulse becomes fuller and less frequent, the skin less parched, soft, and moist, the respiration less laborious, and the countenance more open and expressive of ease.

Inflammation of the peritoneum may be distinguished from colic by the permanency of the pain and the frequency of the pulse, as well as by the tenderness on pressure, even before any tension of the abdomen has taken place; and by the absence of any inclination to go to stool, when the pain is severe.* It is not so easily distinguished from inflammation of the bowels, or enteritis. In this latter disease, however, there is obstinate constipation, and frequently vomiting; while the pain is more acute, and not so much aggravated by external pressure.—(See *Bateman's art.* PERITONITIS *in Rees's Cyclopædia.*)]

In the specific definition it is stated, that peritonitis occurs "with little affection of the subjacent viscera or abdominal walls." In effect, it often happens that these are not at all influenced, and, whenever they are, it is only secondarily; and hereby peritonitis is sufficiently distinguished from puerperal fever. "If the peritoneum," says Mr. Hunter (*On Blood &c.*, p, 244), "which lines the cavity of the abdomen, inflames, its inflammation does not affect the parietes of the abdomen; or if the peritoneum covering any of the viscera is inflamed, it does not affect the viscera. Thus, the peritoneum shall be universally inflamed, as in the puerperal fever, yet the parietes of the abdomen, and the proper coats of the intestines, shall not be affected: on the other hand, if the parietes of the abdomen, or the proper coats of the intestines are inflamed, the peritoneum shall not be affected."

[The researches of Bichat into the tissues of which the various organs consist, confirm Mr. Hunter's opinion, that inflammation of the peritoneum may exist alone, and independent of the subjacent parts. In fact, the organs are composed of several tissues of different natures and structure, and their affections also differ according as this or that tissue happens to be primarily attacked; and the disorder never fixes on all the three coats of the stomach and bowels at once, but first begins in one of them. When the affection is acute, only a single tissue is generally found altered, the others continuing unchanged. Frequently, when the peritoneal covering of an intestine is acutely inflamed, the mucous membrane is remarkably pale.—(*MacAdam in Cyclop. of Pract. Med.*, art. PERITONITIS.)

Not only may the peritoneum be inflamed without the subjacent organs being similarly circumstanced, but such inflammation actually has no essential dependance upon or connexion with those organs. Hence the view sometimes adopted, of gastritis, enteritis, cystitis, &c., being an inflammation seated exclusively in different portions of the serous membrane connected with the stomach, bowels, and bladder, is erroneous, inasmuch as it is supposed that the cases depend upon the corresponding organs. Inflammation of the serous abdominal membrane is never exactly restricted to a single viscus, the surrounding portion of the membrane continuing healthy, but is propagated over a greater or less extent of the peritoneum.—(See *Bichat, Anat. Générale; Leçons d'Anat. Pathol. et Dict. des Sciences Méd.*, art. PERITONITE.)

Numerous dissections of persons destroyed by peritonitis prove, that the whole or only a part of the peritoneum may be inflamed, without the subjacent organs being concerned. In many instances, the muscular and mucous tissues of the stomach and intestines were found unaffected, even when gangrene had begun to show itself in the peritoneum. In general, the marks of inflammation are stronger, in proportion as the disorder is more advanced and violent. Sometimes the membrane seems as if it were very minutely injected; while in other cases, as Bichat remarks, the redness is hardly discernible, the blood having escaped by the collateral vessels.

Bayle, Broussais, and others, have seen as consequences of acute peritonitis:—1. Redness, thickening of the serous membrane, and here and there sloughs penetrating into the mucous coat.

* "Colic may be distinguished from peritonitis by the absence of fever; the pain being relieved by pressure; the state of the pulse; and the suddenness of the attack."—Dr. MacAdam, op. cit. —ED.

2. A solid exudation of unorganized coagulating lymph, in the form of false membranes, uniting the surfaces of the peritoneum. 3. A fluid effusion, sometimes turbid, sometimes limpid or reddish. More or less of a sero-purulent fluid was almost always remarked on the surface of the intestines in various places. Broussais also noticed red coagula on the reddened and thickened peritoneum, unaccompanied with any fluid blood; masses of fibrin, destitute of the colouring particles of the blood; and, lastly, pure blood itself, when the effusion was considerable. Gangrene is a much rarer termination, and, according to Dr. Abercrombie, slight and partial, and always accompanied by a deposition of false membrane. It more frequently occurs, when enteritis coexists with inflammation of the peritoneum.

Most examples of peritonitis terminating favourably, leave after them organized adhesions. In general, little gas is found in the bowels; and it is not to it, therefore, that the great distension of the abdomen, remarked before death, can be ascribed.* One remarkable effect of inflammation of the pertioneum is, to lessen its transparency, and render it even quite opaque.]

From what has been said, it appears that the membranous tunics of the different viscera do not, therefore, always hold an equal intimacy of action. And it would be interesting to follow up the discrepance, and draw a scale of their readiness, or inaptitude, to sympathize with the viscera which they cover. The membranes of the brain, as we have already seen, are so peculiarly disposed to partake of the inflammatory action of the parenchyma, as to render solitary inflammation of the one or of the other a rare occurrence. In the lungs and in the heart, the play of relationship is far less conspicuous, and in the viscera of the abdomen it rarely takes place. And it is owing to this circumstance, that we are able so generally to draw the line between inflammation of the peritoneum and of the intestines, from the pain being much more superficial in the former than in the latter case, and, in many instances, not accompanied with sickness, or any other disturbance of the alvine canal. Portal is too little disposed to admit this distinction, and seems to think that idiopathic inflammation of the peritoneum is by no means a common disease, and that, when it does exist, its manifestation is far from being clear.† But this is to render a general rule universal, and to sweep away from it the exceptions that chiefly establish its proof.

The causes are those of inflammation in general, as cold, residence in damp situations, the abuse of intoxicating liquors, external injuries, ulceration and rupture of some portion of the alimentary canal, and consequent extravasation of the contents of the stomach or bowels,* and a morbid transfer of action; and, in a few cases, sympathy with the adjoining organs, as in puerperal fever. [Peritonitis is alleged to be more common in adults than children; in women than in men; and in sanguine and plethoric individuals than in others.†]

The treatment is, in like manner, that of inflammation in general, particularly that of E. ENTERITIS. Bleeding, both general and local, should be carried into effect copiously and with all possible speed; [nor should the practitioner be deterred from the use of the lancet by the seeming prostration of strength and feebleness of the pulse, which are not uncommon symptoms at the very onset of the disease, especially when the peritoneum of the stomach and bowels participates in the inflammation. Under such circumstances, bleeding will be followed by a rise in the pulse, diminution of the general weakness, and subsidence of pain.—(See *Pemberton on Diseases of the Abdominal Viscera*, chap. i.)] But purging, though at all times of service in inflammatory affections, is less imperiously demanded than in inflammation of the intestines, except where the peritonitis is puerperal, and the system affected generally; in which case we have already observed, that calomel should be given liberally at the commencement of the complaint. [It should be understood, however, that the bowels should always be kept open, and that this should be effected with as little irritation as possible. In ordinary cases, castor-oil, small doses of sulphate of magnesia, and emollient clysters, are

* Tension and tumefaction of the abdomen are constant and characteristic symptoms of peritonitis. According to Dr. MacAdam, they do arise in the early stages from a tympanitic distention of the intestines, though at a later period of the affection, they may be caused by effusion in the peritoneal cavity. In individuals with strong abdominal muscles, the swelling is not very manifest in the early period of the disorder, though the hardness is considerable.—Cyclop. of Pract. Med., art. PERITONITIS; Chomel, Dict. de Méd.—ED.

† Mém. sur la Nature et le Traitement de plusieurs Maladies, tom. iv., 8vo., Paris, 1819. The most important diagnostic symptom between peritonitis and enteritis is, the sensibility of the abdomen to pressure. In peritonitis, pain is excited *by a very slight* degree of pressure, which would produce little or no inconvenience in enteritis. The action of the diaphragm in full inspiration, or coughing, does not produce so much suffering in enteritis; neither does motion of the body or abdominal muscles.—Dr. MacAdam, op. cit.—ED.

* See Abercrombie on Pathology of the Stomach, &c., Edin. Med. Journ., No. lxxviii.; Dr. Crampton and B. Travers in Med.-Chir. Trans., vol. viii.; Lewis in Archives Gén. de Méd., Jan., 1823; also, Dr. Stokes in Cyclop. of Pract. Med., art. PERITONITIS, from Perforation of the Serous Membrane.

† Dr. MacAdam in Cyclop. of Pract. Med. This intelligent physician arranges the causes into the mechanical, the chymical, and the vital. The *mechanical* causes include all injuries inflicted on the abdomen, by falls, blows, wounds, pressure of the gravid uterus, enlarged ovaries, or other morbid growths, extra uterine conceptions, &c. The *chymical* causes include all extravasations into the peritoneal cavity, not quickly absorbed, whether of blood, urine, bile, chyle, or feces. The *vital* causes comprehend all aberrations of healthy actions, transmission of morbid action from a part previously affected to the peritoneum, or extension of inflammation from a contiguous organ or tissue to this membrane. This arrangement seems judicious and well founded.—ED.

the most proper means for this purpose.*] Warm stimulant fomentations may be advantageously applied to the abdomen, and blisters in succession. [The application of a blister should be deferred till the constitutional effects, produced by the inflammation, are partly removed by bleeding.] After a very free use of leeches, I have found more benefit in applying a large folded flannel wrung out in simple hot water, or water impregnated with aromatic herbs, over the whole of the abdomen, and letting it remain there for many hours or till dry, wrapped over with a broad calico or flannel swathe that surrounds the entire body. All we can possibly aim at, in applications of this kind, is a continuation of moist warmth, as in a common poultice; and this is obtained more easily, and with infinitely less fatigue to the patient or danger of giving him cold, than in the ordinary way of applying fomentations. When the bowels have been well opened, opiates may be given with freedom, and especially in union with ipecacuanha, or antimonials, to determine to the surface.

When the INFLAMMATION commences or is seated IN THE OMENTUM or EPIPLOON, the pain is more limited, and points rather towards the superior and middle region of the abdomen, a little above and below the navel; though it sometimes inclines to the right or left hypochondrium. The peritoneum itself does not readily pass into a secretion of genuine pus; and still less so the omentum, which, where ulceration takes place, generally evinces a foul and sanious secretion. Sauvages gives a striking example of this in a woman, who was at first attacked with an acute lancinating pain in the umbilical region; and had a tumour formed towards the right hypochondrium about the size of a man's fist, which by degrees occupied the whole abdomen. By an application of emollient cataplasms, the pain and general swelling were diminished in the course of three days; but a fluctuation in the abdomen was next detected, like that of an ascites; in consequence of which, a trocar was introduced into both sides of the abdomen, and a putrid ichorous fluid was discharged, which induced the operator to enlarge the opening; when sloughs of the omentum, already separated, came away with an intolerable stench, and with about two pounds of what Sauvages calls ichorous water. But the skill of the surgeon was overpowered by the disease, and the patient fell a victim to it.—(*Nosol. Med.*, Class III., Ord. III., XVI.)

The mesentery has but a small degree of sensibility; and hence, as well as from the greater depth of the seat of the disease, MESENTERIC INFLAMMATION is only discoverable by pressure. If the affection be strictly mesenteric, the symptoms are mild and gentle; but this is a rare case, and chiefly occurs when the glands are obstructed, and any accidental irritation is applied to them. Most commonly it is catenated with inflammation of the spleen, liver, or intestines. The chief point of tenderness or pressure is the navel; though, in the commencement of the disease, the pain seems to shoot upward from the back; the bowels are often obstinately confined.—(*J. P. Frank*, op. cit., tom. ii., p. 188.)

The medical treatment will be the same as in HEPATITIS or SPLENITIS: though bleeding, in general, effects but little benefit.

[It is to Dr. Pemberton, M. Broussais, and Dr. Gregory, that the profession is indebted for the best descriptions of chronic peritonitis. The disease advances very slowly and insidiously, manifesting itself only by occasional superficial pricking pains over the abdomen, without the patient feeling any inclination to go to stool; or, as Broussais says, by a sort of constant sensibility in the abdomen, often not distinguishable but by the touch. The pulse is somewhat accelerated, with considerable thirst, white tongue in the morning, and a pallid, doughy countenance. There is no tension of the abdomen, as in the acute species; on the contrary, the skin and abdominal muscles seem to sit loosely upon the peritoneum, which feels like a tight bandage underneath them; or, as Broussais states, the abdomen is slightly swelled and elastic, which symptom increases towards the evening. The appetite and digestion often remain undisturbed; but, in other instances, there are vomitings, which Broussais suspected to happen chiefly when the peritoneal coat of the stomach was affected. The same writer also speaks of the feeling of a ball moving about in the belly, and tending towards the throat; referred by him to the mass formed by the agglutination of the bowels and thickened mesentery, moveable in the effused fluid.

In time, the bowels become agglutinated together, or fluid is effused, so as to produce dropsy. The symptoms are all equivocal, and not one of them pathognomonic. The disease is sometimes the result of protracted acute peritonitis. Old age; a delicate, feeble constitution; occupations confining the abdomen in an habitual state of compression; unhealthy, damp, cold stations, and the rigour of intermittent fever, according to Broussais, are among the chief causes of chronic peritonitis.

By Broussais, chronic inflammation of the peritoneum is regarded as inevitably fatal. The treatment, therefore, in his view, can only be palliative. When any degree of active peritonitis is suspected to prevail, he recommends antiphlogistic remedies, and moderate stimulation of the skin. But when there is no pain, and the symptoms are less marked, he recommends blisters, sudorifics, and the tincture of squills and cantharides, with a nourishing diet.

* Many judicious practitioners are not afraid, however, of prescribing calomel very freely in peritonitis. Thus, Dr. Mac Adam recommends giving from five to ten grains of calomel, joined with one or two of opium, directly after the local bleeding; and this dose to be followed up by smaller ones every three or four hours. After the second or third dose of calomel, the bowels are to be opened with castor-oil and clysters. If vomiting be urgent, Rochelle salts, with the supercarbonate of soda, in a state of effervescence with lemon juice, may be given in repeated doses so as to produce a moderately laxative effect.—Dr. Mac Adam in Cyclop. of Pract. Med., art. PERITONITIS.—ED.

Emetics and purgatives he considers useful only when some incidental complication calls for them.

On the other hand, Dr. Pemberton's treatment consists in the prohibition of animal food and fermented liquors, and keeping the patient strictly on milk and vegetable diet, with small bleedings once or twice a week, generally by leeches or cupping. The bowels are to be kept open with small doses of sulphate of magnesia or castor-oil. Dr. Pemberton differs from Broussais in not regarding chronic peritonitis as totally incapable of cure.*]

SPECIES XI.

EMPRESMA GASTRITIS.

INFLAMMATION OF THE STOMACH.†

BURNING PAIN AT THE PIT OF THE STOMACH, INCREASED ON SWALLOWING; REJECTION OF EVERY THING; HICCOUGH; EMACIATION; OPPRESSION AND DEJECTION OF MIND; FEVER A SYNOCHUS.

If to this species we add the ensuing, or EMPRESMA ENTERITIS, we shall have a general type of fever, according to the doctrine of M. Broussais, and that which is commonly received in the present day throughout France: for we have already observed, that this celebrated teacher regards fevers of all kinds as an inflammatory affection of some part or other of the alimentary canal; or, to give a close copy of his own words, "all the ESSENTIAL fevers of authors," says he, "may be referred to *gastro-enteritis*, simple or complicated; and all the acute examples of this inflammation, in its aggravated form, proceed to stupor, typhomania (*fuligo*), lividity, fetidity, and prostration; and represent what have been called typhus, putrid or adynamic fever, or those in which the irritation of the brain is considerable, whether it amount to inflammation or not, whether it produce delirium, convulsions, &c., or take the name of malignant, nervous, or ataxic fevers." —(*Examen des Doc. Méd.*, &c., *Par. J. F. V. Broussais, Prof. de Méd.*, CXXVIII., CXXXIX., translated by Hays and Griffith, Phila., 1833.)

Having already entered into the question, whether fever be essentially dependant upon inflammation of any particular organ, as the head, the alimentary canal, the liver, or the pancreas, for all have had their respective advocates, and having pointed out the pathognomonic distinctions between idiopathic fever and organic inflammations, it is not necessary to return to any detailed consideration of this subject. But we ought to add, that there seems more foundation for M. Broussais' opinion in France, than perhaps in any other country; since inflammatory affections of the alimentary canal, in some part or other of its length, or under some modification or other, often indeed accompanied with ulceration, appear to be more common in Paris than in any other town or region in Europe, or perhaps in the world. To what cause this is owing has not been very clearly pointed out; the diet is perhaps chiefly concerned, the water has also been denounced; but there are various auxiliaries which are not so easily detected.

The fact, however, admits of no question: for the observations of MM. Prost, Petit, Serres, and others, concur in proving that by far the greater number of febrile attacks in France, whether sporadic or epidemic, are combined with some modification of gastritis or enteritis, and very generally show symptoms of diarrhœa and dysentery. But that, even in Paris itself, idiopathic fever and inflammation of the alimentary canal are distinct diseases, has been sufficiently established of late by the valuable post-obit examinations of M. Andral; which have been conducted upon a very extensive scale for the express purpose of settling this disputed question. This excellent and indefatigable investigator was selected by M. Lerminier, physician to the hospital of La Charité, for the purpose of providing cases and dissections for a valuable system of Clinical Medicine, that has now been in part published. In pursuit of this branch of study, he has been particularly attentive to the state of the alimentary canal through its whole course in patients who have died of fevers of almost every

* Children of a scrofulous habit are subject to one variety of chronic peritonitis, characterized during life by great tenderness of the abdomen on pressure, with occasional paroxysms of acute pain, at first coming on only once or twice a day, but afterward becoming more frequent, after which the child appears quite lively, and free from indisposition. At first the pain is limited, but afterward extends over the whole abdomen, which, in the early stages, becomes swollen and tense, but afterward subsides. The pulse is generally about 100, with some strength and fulness; the tongue clean; appetite irregular, but generally good, and frequently voracious; some thirst; the bowels free, the evacuations unusually large in quantity, and peculiar in appearance, consisting generally of a whitish-brown matter. This state may continue for six weeks or two months, with progressive emaciation, until diarrhœa, attended with petechiæ, puts a period to the child's life. Dissection exhibits the mesentery, bowels, and peritoneum, united together into one mass; the peritoneum thickened, and containing large masses of scrofulous matter; the intestinal mucous membrane perforated by ulcerations, which form numerous communications between the convolutions of the bowels; and the intestines and abdominal cavity containing matter resembling that which was passed during life by stool. The disease is generally fatal. The treatment recommended by Dr. Gregory consists of leeches and fomentations in the early stage, followed by purgatives, mercurial alteratives, tonics, chalybeates, and absorbents. Laudanum is the only means of relieving the pain.—See Gregory on Scrofulous Inflammation of the Peritoneum, in Med. Chir. Trans., vol. xi., p. 262; and Dr. MacAdam in Cyclop. of Pract. Med., art. PERITONITIS.—ED.

† Gastritis, a term commonly used to express an inflammation of all the tunics of the stomach, with the exception of its serous covering; but, says Dr. Stokes, as it is now generally believed that this diseased action commences in the mucous membrane and glands, the term is employed to designate an inflammation of the internal tunic, which may or may not affect the remaining tissues.—See Cyclop. of Pract. Med., art., GASTRITIS.—ED.

type and modification; and he has found, that although, as already observed, this organ, in some part or other, has often given proof of inflammatory action, yet that, occasionally, there has been no such effect whatever, and very frequently none sufficiently violent or extensive to become the cause of dissolution, or even of any serious evil to the living frame. In thirty-eight individuals, eleven only presented traces of gastric inflammation sufficiently distinct to warrant the opinion, that they had influenced the symptoms observed during life. In thirty persons, red patches, eruptions, or ulcers were found in the small intestine; but in fourteen only did these lesions appear to bear any proportion to the severity of the symptoms. In the great intestine the alterations were more rare, and less vehement, than in any other portion of the canal.

On comparing the lesions observed in the three great divisions of the canal, the following results were obtained:—In five patients, the entire tube was exempt from every lesion of consequence. In seven others, they appeared too inconsiderable to exercise any influence on the state of the disease. And where the affection was more strictly and manifestly inflammatory, the effects were extremely diversified. In some cases were found eruptions of varied form and character, occasionally running into ulceration. In other cases, the mucous membrane was studded with large patches of inflammation, and the subjacent cellular tissue was advancing to a gangrenous state. In several instances, the ulcers were detached, and assumed a carbuncular appearance.—(*Andral, Clinique Médicale*, tom. i., Paris, 8vo., 1823.)

In most of these examples, there can be no question of the existence of idiopathic gastritis or enteritis: but the simple fact of the existence of numerous instances of fever, and fever too so violent as to prove fatal, without any such accompaniments, together with the certainty that inflammation and even gangrene of particular parts of the alimentary canal are, in numerous instances, effects instead of causes of fever, are a sufficient ground for regarding fever and inflammation either of this or any other kind as distinct diseases, and prove a complete subversion of Broussais' hypothesis.

Inflammation of the stomach may be either of the adhesive or the erythematic character; the latter is the more common (*J. P. Frank, De Cur. Hom. Morb. Epit.*, tom. ii., p. 250); and the species hence offers us two varieties, with considerably different symptoms; which are chiefly, indeed, the result of the peculiar nature of the fever that accompanies this inflammation, already stated to be a synochus, or fever commencing with caumatic, but terminating in typhous symptoms. For this kind of fever it is not difficult to account. We have often had occasion to state, that the stomach is the common centre of sympathy; it is also an organ of acute sensibility; and it is hence impossible for it to suffer from inflammatory action without suffering severely, and without extending its effects very widely.

α Adhæsiva. Adhesive inflammation of the stomach.	The pain very acute; the fever violent.
β Erythematica. Erythematic inflammation of the stomach.	With an erythematous blush, extending to and visible in the fauces; pain more moderate; fever less violent; pulse low and quick.

Dr. Cullen seems to have been the first writer that distinctly pointed out the nature of these two varieties, which he has unnecessarily advanced to the rank of species, and later writers have justified the expediency of a distinction. This distinction, as already remarked, is produced by the nature of the accompanying fever; and, consequently, in a considerable degree, by the nature of the constitution in which the disease occurs. The fever is perhaps in every instance a synochus, the cause of which we have just stated; but, while in a firm and robust habit the febrile course has, comparatively, but little tendency to pass from the entonic action with which it commences into a dangerous languor and atony, in relaxed and irritable habits it is apt to run into this stage almost from the first, and the synochus degenerates rapidly into a typhoid character.

In both varieties the causes are alike; as external or internal cold suddenly applied in a heated state of the stomach, acrid substances, or excess in eating. The acrid substances chiefly recorded are jalap, and other drastic purgatives taken in excess; sulphuric acid; corrosive sublimate; and very large doses of nitre, or quantities swallowed by mistake, as an ounce, or an ounce and a half, of both which we have an example in the Journal de Médecine.—(*Laflize*, tom. lxxi.; *Souville*, tom. lxxiii.) It is also said to have sometimes been produced by a severe paroxysm of chololithus (*Calt schmied, Pr. de Ægro inflamm. ventr. demortuo calc*, &c., Jen., 1757); and occasionally to have followed *trichosis Plica*, the matted hair of Poland.—(*De la Fontaine, Chirurg. Méd.*) A sudden chill, from swallowing cold water or some other fluid when the body is heated, is a frequent cause: as is also repelled gout, indigestible food, and especially ardent spirits drunk profusely.

The symptoms are sufficiently detailed in the specific definition. Several of them are those of cardialgia; but, in the latter, there is neither fever nor vomiting. The most decisive signs are a permanent local pain, and general emaciation; and these, as M. Chardel has justly observed (*Monog. des Degén. schirr. de l'Estomac*, 8vo., Paris, 1808), increase with the prolongation of the disease, till both become extreme, and even opium will scarcely relieve the former, in whatever quantity administered.* In a few cases, the food is not rejected for several days; and as the bowels are constipated, and the digestion is imperfect, it remains in the stomach,

* General emaciation can only be expected in cases which are chronic, and of longer duration than the acute form of gastritis.—ED

and forms a tumour sensible to the pressure of the hand, which, upon rejection, disappears. The presence of this tumour is peculiarly characteristic of an inflamed state of the pylorus, as its absence is of the same state of the cardia; for, in this last case, the contraction of the cardia renders deglutition extremely difficult, and the food is for the most part rejected without reaching the stomach.* From the close sympathy of the stomach with other organs, the disease has sometimes been accompanied with delirium, and in a few instances with hydrophobia. Where the inflammation is violent, it destroys in a few days. If no fatal symptom occur within the first week, it terminates for the most part favourably. Shiverings and a remission of pain are, as usual, marks of suppuration.†

Of the ADHESIVE VARIETY Mr. Cruickshank has given a good illustration in the case of a young lady who died after two or three days' illness, before which she had been in perfect health. "I was called in," says he, "but she was dead before I got to the house. From her history I was at a loss to account for her death; but on opening the abdomen a day or two after, I found the contents of the stomach in that cavity; that they had produced peritoneal inflammation, and killed. On examining the stomach, I found a hole in it large enough to admit the end of my finger. This hole had been formed by absorption of part of the substance of the stomach from scrofulous ulceration: its edges had adhered by inflammation to the under surface of the small lobe of the liver. This inflammation was evidently raised by the powers of the body to prevent the accident which happened. and if no violent vomiting had taken place, and torn this adhesion at this particular time, she might have lived for years, notwithstanding the ulcer."—(*Anat. of the Absorbent Vessels*, p. 122.)

In many cases of this kind the inflammation is chronic, and indeed of long standing; for the diseased parts of the stomach exhibit great thickening and induration. Where the inflammatory action proceeds very slowly, it is often astonishing to find how little the general health, or even the local state of the stomach, is disturbed. For, as in the case before us, it proceeds without being suspected till the ulcer is complete, the external tunic gives way, and the contents of the stomach are evacuated; which irritate, as a foreign body, in whatever situation they are lodged, excite a new and active inflammation, and destroy in a few days. This indeed is the usual termination, whatever be the progress. Yet the march of the disease is not always thus quiet or deceitful; for it is often preceded by many or all the ordinary concomitants of dyspepsy, as acidity, eructations, flatulence, and oppression of the stomach after eating; often, indeed, accompanied with emaciation and debility, and not unfrequently with hæmatemesis; by which last signs it is chiefly to be distinguished from idiopathic indigestion. The death, however, is commonly sudden, within a day or two, or even a few hours, from the cause just stated. M. Chardel (Op. cit.) has given various examples of this form: M. Gerard (*Perf. spon. de l'Estomac*) and Dr. Abercrombie, others. —(*Edin. Med. and Surg. Journ.*, vol. xxi., p. 1.)

[It is observed by the latter writer, that acute inflammation of the stomach is not a common disease in this country,* and when it does occur, the symptoms are so severe and well-defined as immediately to indicate the nature of the affection.† But the stomach is liable to inflammatory action in a chronic form, which often advances so slowly and insidiously, that the dangerous nature of it may be overlooked, until it reaches that stage in which it assumes the characters of organic and hopeless disease. In the early stage, the prominent symptoms, in

* Dr. Good does not seem to have been aware, that inflamed muscular fibres are not so much disposed to contract as when they are healthy. This fact, which was distinctly mentioned by Desault, is confirmed by later observations. However, the disease called gastritis is seated chiefly in the mucous membrane, and is extremely rare in the acute and idiopathic form.—(See Abercrombie's Pathol. and Pract. Obs. on Diseases of the Stomach, &c., i., p. 13, edit. 2.) This physician confesses that he has never seen a case of this nature (p. 15). Dr. Stokes also says, inflammation of the stomach in its highest degree is rarely met with, except in cases of corrosive poisoning. From such examples he infers, that the symptoms would be "intolerable thirst, constant nausea and vomiting, præcordial distress, sunk countenance, extraordinary prostration, fever."—(Cyclop. of Pract. Med.) It is conceivable, however, that the action of a corrosive poison on the stomach might lead to other consequences than those of simple inflammation: the local effects would be more rapid, more certainly fatal, and the immediate effects on the system different.—ED.

† It seems as if the general symptoms, as well as the effects of the inflammation on the stomach itself, were liable to variety. In a case recorded by Mr. Annesley, in his work on the Diseases of India, the early symptoms were acute pain in the stomach, increased by pressure, with slight fever, and *no vomiting*. On the fourth day vomiting began, and the patient died on the seventh. The coats of the stomach were found thickened, and its internal surface minutely injected. And, in another instance related by the same gentleman, and which was fatal in seven days, the symptoms were, incessant vomiting and hiccough, with fever of a tertian type, but no complaint of pain. The mucous coat was covered with small ulcers.—ED.

* The same remark will equally apply to this country; though it deserves to be noted, that dissections have demonstrated the stomach to be more frequently than any other organ the seat of the immediate ravages of yellow fever, as it has prevailed in the United States.—D.

† Acute idiopathic inflammation of the mucous coat is a rare disease in this country. As Dr. Abercrombie observes, it is from the action of poisons that we chiefly meet with inflammation of that coat of the stomach; but such cases cannot be regarded as necessarily exhibiting the same symptoms which would accompany the idiopathic form of the disorder.—(On Dis. of the Stomach, &c., p. 13.) In fact, we know that each poison is productive of symptoms peculiar to itself, and hence, in this point of view, our author's definition cannot but be imperfect. According to my own judgment, it would have been more consistent with the plan of this system to have treated here only of idiopathic gastritis.—ED.

fact, merely indicate derangement of the functions of the stomach, and are consequently very apt to be included under the general term dyspepsy.]

Gastritis in its ACUTE form has often been represented in a more dangerous light than it deserves to be; for, in neither variety, under this modification, is it frequently attended with fatal effects under judicious treatment. In the true adhesive form, copious and repeated venesections have been very generally recommended, and have often been found of the highest advantage, particularly in robust and vigorous habits.* To be, however, of any decided avail, this plan of treatment should be commenced early; for the fever is so apt to pass into a typhoid form, that, after the first two or three days, too much inroad will generally have been made upon the constitutional strength to allow the use of the lancet. If acrid poisons or excess of eating be the cause, an emetic should be administered; but otherwise this, as well as all other stimulants, should be avoided. Gentle cooling laxatives,† a blister applied after bleeding to the pit of the stomach, mild nutritive drinks (Dr. Stokes particularly recommends cold ones, such as iced water, iced lemonade, &c.), nutritious injections, and, if the pain or sickness be extreme, doses of a drachm of the sirup of white poppies, and perhaps about five grains of nitre in an emulsion of gumarabic or spermaceti, will generally be found the most successful plan. It is, however, extremely difficult to get any medicine to remain on the stomach; and hence the best preparation is that of pills. [In idiopathic inflammation of the internal surface of the stomach, or when that surface becomes inflamed in the progress of dysentery, gout, or other diseases, Dr. Cheyne has often directed entire abstinence from medicine of every description, and from fluids even of the blandest nature, until the inflammation has been removed by bleeding, blistering, fomentations, &c. The inflamed stomach, he observes, is often incapable of retaining even a spoonful of water, and at first, every description of medicine produces an aggravation of sickness, vomiting, and general distress. After one or two days, calomel, in doses of one grain, may be repeated every hour, or four or five grains, and half a grain of opium, given every third or fourth hour, alternating these medicines with a solution of Rochelle salts and soda, to which lemon-juice may be added. But before these remedies be employed, he particularly enjoins a previous reduction of the inflammation.—(*Dublin Hospital Reports*, vol. iv., p. 266.)] If gangrene take place, all further exertion will be in vain; and we may determine its presence by a sudden cessation of pain, coldness about the præcordia, and languid or intermitting pulse, which are its sure attendants. Under the chronic form we have just noticed, Dr. Abercrombie has found sulphate of iron, in the proportion of two or three grains three times a day, a valuable and decisive remedy, and it is well entitled to attention. [The utility of leeches and counter-irritation on the epigastrium, with a strict regimen, is universally acknowledged, and the superior success of this practice in the cure of many cases of dyspepsy from chronic gastritis, is a fact attested by all the most judicious practitioners.]*

Upon the ERYTHEMATIC VARIETY, the following remarks of Mr. Hunter are too valuable to be omitted; and they are the more valuable, as they apply to disorders of other internal cavities besides the stomach. "There is," says he, "an inflammation which attacks internal

* In a weak subject, or where an acute attack supervenes on a chronic gastritis, Dr. Stokes deems general bleeding almost inadmissible. "The great remedy," says he, "is the application of leeches to the epigastrium, which should be done freely and repeatedly, until decided relief be obtained."—Cyclop. of Pract. Med., art. GASTRITIS.—ED.

† "The bowels, which are commonly confined," says Dr. Stokes, "are to be relieved by enemata; but on no account is purgative medicine to be given by the mouth."

* A peculiar species of gastritis occurs in some parts of America, particularly in Ohio, Tennessee, Illinois, Missouri, North and South Carolina, and Georgia, that merits a passing notice. By some practitioners it is called *sick stomach*, but it is more generally known by the term *milk sickness*. Although some physicians, with Dr. Wright (see Western Med. and Phys. Journ., 1827), consider this disease as the common autumnal fever of the country, yet the majority of them believe that it presents an additional instance of the influence of animal disease on the human constitution; and that it arises in the human subject from eating food prepared in some manner from animals which are affected with a disorder of the same character: and experiments have been made, and facts are numerous, proving in the most direct manner the conveyance of the disease from one animal to another by milk.

Among the symptoms of this disorder, as detailed by Dr. Yadkin (Transylvania Journal of Medicine, vol. i., p. 318) the following are the most remarkable:—"After the use of milk, butter, or recently slaughtered meat, the individual is attacked with a distressing sense of burning in the epigastrium, followed by vomiting, with insatiable thirst. These symptoms are uniformly pathognomonic, and continue throughout the complaint. The bowels are constipated; the pulse, at first natural, becomes in the sequel small, tense, vibratory, and often irregular. Epigastrium tender to the touch; body hot, extremities cold; the patient's breath has a peculiar odour, sui generis, which is indescribable. The symptoms of the chronic form of the complaint are, a slight burning in the stomach, continued, and distressing; occasional vomiting; general debility; costive bowels; sullen countenance; intellectual dulness."

In the treatment of this disease, Dr. Y. observes, that cathartics are the sheet-anchor; and he prefers calomel, the operation of which is to be assisted by stimulating enemata, until free catharsis is induced, and then the patient may be considered as convalescent. Venesection, blisters, and cold affusions to the extremities, are also useful. The chronic form of the complaint is to be treated with calomel in minute doses, given to salivation, epispastics, castor-oil, sulphur, and the alkalis.—(See M'Call in the Med. Recorder, vol. vi., p. 254; and L. Beck, in the New-York Med. and Phys. Journ., vol. ii.)—D.

canals, which is classed with the erysipelatous; but how far it is the same I do not know. It is certainly not the suppurative. Whatever it is, it may be considered in some of its effects to be in direct opposition to the adhesive and suppurative inflammations; for where the adhesive most readily produces adhesions, there the erysipelatous does not, as in the common cellular membrane; and where the adhesive seldom takes place, excepting from extreme violence, there this inflammation (if erysipelatous) has a tendency to produce adhesions, as in canals or outlets. It also opposes in some degree the suppurative, in being backward in producing suppuration, even in those places where suppuration most readily takes place, such as canals and outlets; for there, as above observed, it more readily throws out the coagulating lymph. Whatever the inflammation may be, it is certainly attended with nearly the same kind of constitutional affection. The fever in both appears to be the same, viz., accompanied with debility, languor, &c.—(*On Blood*, &c., p. 270.)

The erythematic inflammation of the stomach comes on more insidiously than the adhesive; and is best characterized by the inflammatory colour of the fauces, for it usually spreads to these, and the lowness and rapidity of the pulse. The inflammation often extends through a great part of the alvine canal, as well as the œsophagus; and, after a subsidence of the sickness, produces diarrhœa, and mucous discharges from the bowels. It is sometimes so gradual and tardy in its progress as to produce little fever, or even local disturbance, for many days or even weeks.

If this variety of gastritis be excited by acrid or poisonous substances, the stomach-pump should be used, or a brisk emetic be exhibited with as much speed as possible; and afterward such antidote as the character of the poison may point out: opposing acids to alkalines, and alkalines to acid erosives, and the most active stimulants to narcotics. When the cause is internal, mild, diluent, and cooling drinks are to be employed freely. The infusion of roses will often prove one of the most serviceable medicines we can make use of; blisters should be applied and repeated, and the bowels kept open with laxative clysters.

Inflammation of the stomach is also found in the one or the other of its varieties, as an occasional symptom in aphtha, measles, smallpox, and other exanthems, tetanus, and hydrophobia.

We may here observe, that the PANCREAS is also sometimes, though rarely, affected with inflammatory action; and that, in this case, the symptoms are a combination of empresma gastritis and e hepatitis. There is pain and distention in the epigastrium, with frequent vomiting. There is also a defined tumour seated higher than the iver, and generally more polarized, but always accompanied with some degree of jaundice, from its pressure on the bile-ducts. The affection often yields to depletion by cupping, brisk purgatives, and blistering.*

* Perceval, in Trans. King's and Queen's College, Dublin, vol. ii., p. 128, 1824. To all who desire a correct knowledge of affections of the mucous membrane of the stomach, the editor strongly recommends the Memoir by M. Louis, entitled "Du Ramollissement, &c. de la Membrane muqueuse de l'Estomac."—Mém. Anat. Pathol., Paris, 1826.

SPECIES XII.

EMPRESMA ENTERITIS.

INFLAMMATION OF THE BOWELS.

GRIPING PAIN IN THE BELLY; TENDERNESS, AND VOMITING; FEVER A SYNOCHUS.

In inflammation of the stomach, the pain is seated higher, and is rather burning than griping; this last, also, has usually some degree of hiccough, and great dejection of mind: neither of which belongs to inflammation of the intestines; and it is by these characters that the two are to be distinguished from each other. Stoll adds, that intestinal inflammation is also accompanied with a suppression of urine; but we cannot rely upon this as a specific symptom.

Our opening remarks upon gastritis, in respect to the nature of that disease in France, apply to the present as well. Enteritis also exhibits two varieties:—

α Adhæsiva. Adhesive inflammation of the bowels.	Pain very acute; fever violent; vomiting frequent; and costiveness obstinate.
β Erythematica. Erythematic inflammation of the bowels.	Pain more moderate; fever less violent; little vomiting; and diarrhœa, instead of costiveness.

Of these varieties the former is more frequent in this species, as the latter is in the preceding.—(*Frank*, ut suprà, tom. ii., § ccxxxviii., p. 250.)

The causes of both, as also of the accompanying fever being a synochus, may be understood from the remarks already offered upon gastritis; the intestines partaking in a very considerable degree of the character of the stomach.

[Medical writers do not always agree respecting the meaning of the term *enteritis*. Some imply by it an inflammation of the several tunics which form the intestinal canal; while others signify an inflammation of the mucous membrane that invests the bowels from the pylorus to the anus. The inflammation, however, sometimes extends from the mucous coat to the others, so as to affect the whole thickness of the intestines. The inflammation may also be either acute or chronic.—(See *Dict. des Sciences Méd.*, tom. xii., p. 359.)]

To the causes enumerated under gastritis, may be added some natural or accidental organic mischief in some part or other of the intestinal canal, as ventral, inguinal, or other hernias, or introsusceptions of various kinds; or infarctions from coprostasis, scybala, or enterolithus. The plica polonica, or matted hair, is said by De la Fontaine, to be a cause of this species, as other writers affirm it to be of gastritis.

The progress of the FIRST VARIETY usually commences with a sense of coldness or shiver-

ing, and an uneasiness in some part of the belly, at first remitting or intermitting, but gradually acquiring permanency, and rising into an acute pain. The pain now spreads over the whole abdomen, which is tense and tender to the touch, though less so than in peritonitis; there is great flatulence, accompanied with occasional spasms that shoot backward to the loins, usually obstinate costiveness, and unconquerable vomiting, though sometimes diarrhœa and tenesmus. The pulse is small, hard, and frequent, but has sometimes been soft; the tongue dry; thirst extreme; urine high-coloured, small in quantity, and discharged with difficulty; the breathing is laborious; and from the contraction of the abdominal muscles, the patient is perpetually bending forward.—(Περὶ Νουσῶν, iii., p. 491.) If no beneficial change take place, all these symptoms become aggravated; instead of feculent stools, there is an ineffectual straining, with a small mucous discharge; and with the increase of the retching, the feces burst through the valve of the colon, and are occasionally thrown up from the stomach. At length the torture suddenly diminishes, and the patient appears to have obtained relief; but his pulse intermits, his face grows pale, his extremities cold, convulsions succeed, and he sinks in death.*

The general termination, therefore, when unfortunate, is that of gangrene; for it is rarely that the inflammation runs into a suppurative state. If, in the course of the first two, three, or even four days, a free feculent discharge can be procured from the bowels, the vomiting and pains will gradually diminish, the pulse abate in quickness, and the patient be in the way of recovery.

In treating this complaint, it is hence of the utmost importance to procure free evacuations, for the cure depends almost entirely upon our success in this respect. Yet the difficulty is often very great, and increased from the tendency of the stomach to reject whatever medicines are introduced into it. Most practitioners commence with bleeding, which they urge very copiously, and repeat every six or eight hours, according as the pulse will bear the lancet. The remarks we have made upon this practice, under GASTRITIS, will apply to the present species. If the disease occur in a patient of a hardy and vigorous habit, and particularly if we have an opportunity of employing venesection within the first day or two, we shall commonly find it of essential service: but if we do not succeed, we shall assuredly hasten the stage of gangrene, and abbreviate the term of remedial operations. And hence, unless free bleeding can be employed early, and the constitution evinces a tolerable portion of vigour, there is no inflammation in which the lancet is less likely to be serviceable, or may become more mischievous. To local bleeding, even under the conditions we are now supposing, there is less objection; but we have less chance of benefit from it than in peritonitis.*

* Inflammation seems to destroy the action of the muscular fibre. Thus, intestine which has been highly inflamed, is generally found in a state of great distention, showing the complete loss of its healthy muscular action; and if the disease has gone on until the intestine has either become ruptured, or has given way by ulceration, it is found to have fallen together like an empty bag; whereas, healthy intestine, when it is empty, contracts uniformly into a round cord. When we find gangrene, we have reason, in general, to conclude, that inflammation has existed in the muscular coat; but each of the coats may be inflamed separately, and give rise to important differences in the symptoms.—(See J. Abercrombie's Pathol. and Prac. Researches on Dis. of the Stomach, &c. p. 7, ed. 2, Edin., 1830.) The following are the general symptoms of inflammatory affections of the digestive tube, as described by Dr. Stokes:—Indigestion; anorexia; vomiting; thirst; jaundice; tympanitis; constipation; alteration of the fecal discharges in quality or quantity; pain; tenderness on pressure; contraction of the features; morbid state of the tongue; dryness of the skin and conjunctiva; suppression of the urine; stupor; delirium; headache; prostration; accelerated and thoracic respiration; fever. "We shall find," says he, "that the greatest variety in the combinations of these symptoms may occur, principally arising from the following circumstances: the intensity and extent of the inflammation; the situation of the disease, both as to the different parts and tissues of the tube; the complications with other diseases; the different degree of excitability of the nervous system in different individuals. Thus, when the inflammation is extensive and severe, occupying both the stomach and intestines, we may have the worst forms of bilious and gastric fevers; when it occupies the duodenum, jaundice is a common symptom; and the disease may occur with or without fever; in the small intestine, a slight inflammation is often nearly latent, or only pointed out by a little swelling or pain; while in the cœcum or colon, the disease produces all the varieties of diarrhœa and dysentery. When the upper portion of the tube is engaged, constipation is a common symptom; when the lower, the reverse takes place. If the mucous membrane alone is engaged, pain and costiveness are often absent; but, when all the coats are in a state of acute irritation, we may find the most violent symptoms of peritonitis and ileus, with contractions, intussusceptions, &c. The complication of the disease with other affections also produces great varieties. Thus, when it occurs in the advanced stages of phthisis, diarrhœa is often the only symptom; or, when complicated with erysipelas, or pneumonia, its most prominent indication is an extraordinary prostration. The different degrees of excitability of the nervous system cause the greatest irregularity of symptoms: in the child, acute enteritis is commonly mistaken for inflammation of the brain; in the adult, a circumscribed irritation will in one case be accompanied by violent delirium, while, in another more severe, this symptom shall be completely absent."—ED.

* Modern practitioners speak more decidedly in praise of bleeding than our author has done. Thus, Dr. Stokes gives it as his advice, that the lancet should never be neglected; and that, if the violence of the disease continue unsubdued, venesection should be frequently repeated. After the first bleeding, Dr. Abercrombie recommends smaller quantities of blood to be taken away. The great efficacy of general bleeding alone in reducing inflammation of the mucous membrane is considered, however, by Dr. Stokes, to be a well-established fact; but when the disease has been in the small intestine, he has always found the greatest advantage from local bleeding. If the symptoms

From the first, therefore, we must attempt cathartics. If the stomach will retain the milder, as castor-oil, neutral salts, or senna, these are by far the most advisable; as our object should be to diminish, instead of increasing the irritation of the intestines. But, in the first species, this is rarely the case; and we must hence, without loss of time, apply to those that are more active; as calomel in combination with the colocynth pill; assisting their operation by injections frequently repeated, and in as large quantity as the bowels will retain.

It does not necessarily follow that the irritation of these more active purgatives will add to the inflammatory irritation; nor do we always, or even commonly, find any such effect. For, firstly, the operation of the two irritations is very different; and, by exciting the former, we may even diminish or take off the latter by a transfer of action, in the same manner as we take off inflammation from any other organ by the application of a blister to some neighbouring part. Secondly, the direct effect of the cathartic is to restore a natural action, the peristaltic action of the intestines, which it is the direct effect of the inflammatory action to oppose. And, thirdly, we find, in fact, the beneficial influence of such a practice, not only generally, but almost uniformly, and are incapable of accounting for it upon any other principle.

Opiates would be desirable through the whole course of this disease, but that, in their general intention, they add to the costiveness if given alone, and retard the effect of purgatives if given in conjunction with them. Nevertheless, if after copious bleeding the costiveness should be intractable, and the flatulence and spasmodic pains very distressing, it will be better to trust for a few hours to two or three grains of opium alone, and withhold the purgative plan for the present. [Opium is frequently useful in quieting the sickness, and in enabling the stomach to retain laxative medicines.] Dr. Baillie recommends as a general rule, "the inflammation to be subdued, or at least much lessened, before any active purgative be administered."—(*Lectures and Obs. on Medicine*, 1825.) But we have already stated the principle on which purging and bleeding may be combined from the first in ordinary cases.

[The editor's experience leads him to place more reliance on early and free bleeding, and less on premature purging, than the author. The excessive constipation of the bowels is in general merely an effect of the inflammation, and is often attacked with active purgative medicines, as if it were the primary object, and the source of all mischief. The inflammation is to be subdued by bloodletting from a large orifice to an extent which must be various, and repeated or not, according to the constitution of the patient, and the violence of the symptoms. Purgatives given by the mouth are not generally successful, when the inflammation has not been previously checked by local and general bleeding and blistering. Dr. Gregory used to remark, in his lectures, that a purgative had often been known to operate as soon as a blister applied to the belly began to rise; and this observation is still more commonly verified after free venesection.*]

Fomentations and blisters to the abdomen form a regular course of the therapeutic plan, and have, no doubt, been occasionally serviceable; but, like local bleeding, they are less so in the present disease than in peritonitis. And, where fomentations are advisable, I prefer the epithem of a folded flannel wrung out in hot water, and confined with a swathe, as already recommended in peritoneal inflammation, to all other fomentations whatever.

Injections of warm water alone forcibly thrown up the rectum in as large a quantity as the bowels can be made to contain, are moreover often found of essential benefit, and are generally to be preferred to the warm bath, which, by adding to the debility, has accelerated the approach of gangrene.

After the bowels have been freely emptied, diaphoretics, and especially combined with opiates, will be the best plan we can pursue; and if the stomach become quiescent, the patient should drink freely of diluents.†

There is a singular fact noticed by Rhodius (Cent. ii., obs. 69), which sometimes occurs in this disease, and is peculiarly worthy of notice, as sustaining our hopes to the last: and it is this; that occasionally, in the extreme moment of a seeming mortification, a sudden revolution takes place, and stools are evacuated; and this, too, after the extremities have begun to grow cold, and an apparently deadly languor has

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do not yield at once to this treatment, the leeches are to be repeated, and a large poultice applied over the belly. The bowels are to be gently opened by the mildest laxatives, and emollient injections should be frequently given.—Cyclop. of *Pract.* Med., art. Enteritis.—Ed.

* Bateman on Enteritis, in Rees's Cyclopædia. Also, Edin. Med. Surg. Journ., vol. i., p. 64. When enteritis is joined with diarrhœa, the warm bath, leeches, a blister, anodyne injections, and small doses of pulv. ipecac. comp., with or without rhubarb, are some of the remedies commonly resorted to. In the early stage, astringents are pernicious.—Ed.

† For allaying the vomiting, the common practice has been to give effervescing draughts of the carbonate of soda or ammonia, with or without a few drops of the tinct. hyosciami to each draught; the region of the stomach being sometimes fomented with the decoction of poppy-heads. Dr. Stokes has found nothing so efficacious as the application of a dozen leeches to the epigastrium, and the liberal use of iced water, or even ice, which may be given *ad libitum*. In the more advanced stages of the disease he has constantly applied leeches to the epigastrium, though in smaller number, and has seen what has been called the typhoid state disappear after their use. He has also applied a small blister to the epigastrium, and afterward sprinkled the surface with a little of the acetate of morphia, according to the plan suggested by M. Lembert in tetanus, hydrophobia, and some other cases, where the patient may not be able to swallow medicine at all.—See Leçons Orales de Clinique Chir., faites par M. le Baron Dupuytren, tom. ii., p. 608, 8vo., Paris, 1832.—Ed.

overpowered the frame. In such case, we must snatch the patient from impending death by a free use of wine, and warm generous cordials; closely attending, at the same time, to a copious discharge from the bowels, of which, with the liberal plan now recommended, we need not be afraid, and which we should be extremely cautious of checking by opiates.

From the less threatening character of the symptoms, as they show themselves in the ERYTHEMATIC VARIETY, this affection often exhibits a fallacious appearance, and is misunderstood. "Sæpè," says Professor Frank, "nec febris in pulsibus umbra; ardor, dolor, ad intestina aut nullus, aut certè non vehemens; nec ferè ulla tam diri morbi phænomena observantur."—(Op. cit., tom. ii., p. 254.) Its real nature, however, is as we have explained it above: and, from the debility superinduced, ascites has occasionally followed rapidly. It has been well ascertained, that the seat of this variety is sometimes in the external coat of the intestines, and it is said, by some writers, that this is the most common seat. It is not easy to determine upon this point: nor always, at its commencement, whether the inflammation be of the one variety or the other; the modifying causes being, in some constitutions, and some seasons of the year and temperaments of the atmosphere, so nicely balanced as to leave the course doubtful.

In distinct and simple examples of erythematic inflammation, bleeding ought unquestionably to be abstained from; and acids, and the milder tonics, and bitters, as infusion of roses, cascarilla bark, and cinchona, supply its place.

We have said, that in enteritis there is less pain and tension to the touch than in peritonitis. It is singular, that at times there should be little or none whatever on pressing the abdomen. "Gastro-enteritis," observes M. Broussais, "exists without any painful point, when the inflammation is not vehement in the stomach and duodenum; and pressure of the belly does not produce uneasiness."—(*Examen*, &c., prop. CXXXVI., *Par. F. J. V. Broussais.*) M. Petit speaks nearly to the same effect, though he modifies the opinion; affirming, "that if the belly be pressed a little deeply at its lower part, especially towards the right, between the spine of the ilium and the navel, the patient is sensible of pain, and at times makes complaint of the pressure, and exhibits the same by his countenance."—(*Traité de la Fièvre Entero-Mesentérique*, &c., p. 131.) Yet, even in ulcerations of the mucous membrane, there is not always much uneasiness. "Nothing," says M. Andral, "is more common than an absence of every kind of pain in cases in which numerous ulcerated spots cover the inner surface either of the ileum, or of the cœcum, or of the colon; while we frequently see patients complaining of sharp abdominal pains, where the gastro-enteric mucous membrane is not inflamed."—(*Andral, Clinique Médicale*, tom. i., 8vo., Paris, 1823.)

The last of these writers has lately favoured the world with a valuable and extensive range of examinations into the state of the alimentary canal in patients who have died of gastritis and enteritis; and we are hence enabled to arrive at some calculation of the comparative frequency of inflammatory action in different parts of the canal. Ulcerations, he observes, may take place in every part, from the cardiac orifice to the anus; but they are not in all places equally common. They are rare in the stomach, and still more rare in the duodenum and jejunum: they are very frequent in the lower third of the small intestine, and they are again less frequent in the different parts of the great intestine. These conclusions are drawn from the following observations, comprising seventy-one distinct cases of disease:—

In ten individuals ulcerations were found in the stomach; in one in the duodenum; in nine in the jejunum; in thirty-eight in the lower part of the ileum; in fifteen in the cœcum; in four in the ascending colon; in eleven in the transverse colon; in three in the descending colon; in one in the rectum.

I have said that enteritis is sometimes a result of hernias. It has also, occasionally, been produced by a forcible protrusion of a part of the intestinal canal through the anus; of which a singular instance is given in the Medical Transactions, vol. iv., in a paper communicated by Dr. Latham. The part of the prolapsed intestine was very considerable, and the injury was occasioned by the passage of the wheel of a cart over the loins; a portion of the mesentery was protuded with that of the gut; gangrene supervened to the inflammation, and the prolapsed mesentery and intestine were cut off above the line of gangrene; the latter to a length of not less than fifty-seven inches. The patient, who was a boy, recovered; had motions regularly from the truncated extremity of the remaining intestine; and was able afterward to walk twelve or fourteen miles a day. He had no power, however, of retaining his feces.*

* Enteritis, a formidable disease in its idiopathic form, is also found to supervene in the course of other affections. Thus, it is daily noticed as a complication of fever. From what has been stated in a previous part of this work, however, when it occurs in typhus, it is not the cause, but simply a consequence of that fever; though, as Dr. Stokes has justly said, it is not the less important with reference to the prognosis and treatment. Compared with other affections, both acute and chronic, the frequency of intestinal disease must strike every observer. Andral declares, that in the great majority of diseases of other parts, a derangement either in the functions or structure of the intestinal canal will occur; and that, in chronic diseases, whatever be their nature, it is extremely rare for the digestive tube to escape alteration.—(See Cyclop. of Pract. Med., art. ENTERITIS.) In this country, where it is so usual to attribute many complaints to affections of the liver, it is, as Dr. Stokes observes, of great importance that the relation of cause and effect between irritations of the upper part of the intestinal tube, and derangements of the hepatic function, should be carefully studied. "It is true, that gastro-duodenitis may exist without jaundice, or that hepatic inflammation may arise independent of disease in the mucous membrane; but, it is equally true, that the symptoms of gastro-duodenitis, both acute and

SPECIES XIII.

EMPRESMA HEPATITIS.

INFLAMMATION OF THE LIVER.

TENSION, SORENESS, AND PAIN IN THE REGION OF THE LIVER; PAIN ABOUT THE RIGHT SHOULDER; FELT ESPECIALLY WHEN LYING ON THE LEFT SIDE; SHORT, DRY COUGH.

Inflammation of the liver, which may in general be sufficiently known by the above characters, has also two varieties, dependant upon its rapid and violent, or more tardy and obscure march.

α Acuta. Acute inflammation of the liver. — In which the above symptoms are clearly marked, and the character of the disease is decisive.

β Chronica. Chronic inflammation of the liver. — In which the specific character is obscure; and the existence of the disease suspected from a previous exposure to its causes, in connexion with an occasional recurrence of the pathognomonic symptoms, accompanied by a slight degree of fever.

Next to the lungs and the brain, no organ more frequently has an hereditary predisposition to disease than the liver; and Frank has witnessed families suffering in consequence of it, as well in the acute as in the chronic form of inflammation.—(Op. cit., tom. ii., p. 268.)

The ACUTE VARIETY commences with the ordinary symptoms of visceral inflammation; chilliness, succeeded by heat, frequent pulse, and a furred tongue: the bowels are irregular, mostly costive; the evacuations little tinged with bile, the urine often saffron-coloured; the skin is dry, the thirst extreme, with occasional sickness.

No physiologist has yet been able to explain the cause of the pain so generally felt in the right shoulder. It is, however, sympathetic of other affections of the liver, as jaundice, or chololithus, as well as hepatitis; and hence it should seem to be produced by almost any morbid excitement of this organ, whether from inflammation, or the obstruction of gall-stones. [In several cases of hepatitis, reported by M. Louis, and the nature of which was verified by dissection, there was no pain in the right shoulder. Hence, this distinguished pathologist is disposed to doubt whether it be a symptom truly appertaining to the complaint, and suspects that, perhaps, when it does occur, the hepatitis is complicated with disease of the right lung, or pleura.*] The cough, which is often very distressing, is easily accounted for from the vicinity of the diaphragm to the seat of disease, and its sympathy with the liver. The sickness of the stomach is from the same cause.

The disease is sometimes accompanied with a jaundiced colour of the skin, and Sauvages and Sagar have made such a colour a specific symptom; but it is not always that the bile regurgitates, and, hence, such an appearance ought not to be enumerated among the pathognomonic characters.

Even where it exists, it is not a distinct symptom of hepatitis; for, to say nothing of proper jaundice, the feces, as Dr. Latham has well observed, may be light-coloured, and the eyes, skin, and urine peculiarly yellow, from the pressure of an indurated pancreas upon the bile-ducts, and an obstruction of their course.† [Out of five cases of hepatitis, detailed by M. Louis, four were attended with yellowness of the skin and pain in the right hypochondrium, but tension of the same part was remarked only in two. The concurrence of all these three symptoms actually characterizes hepatitis; but one or two of them alone accompanying an acute disorder, M. Louis thinks, have little validity; for, with respect to the yellowness, it frequently takes place in such case without any hepatitis; and as for the pain, it may depend upon so many causes, that it is not a very conclusive symptom. When, however, pain in the right hypochondrium and jaundice arise from chronic diseases, M. Louis has never seen the latter effect without an accompanying inflammation of the liver.—(*Louis, Mém. Anat. Pathol.*, loc. cit.)]

The ordinary remote causes are, suddenly suppressed perspiration, especially from currents of cold and damp air, and excess of spir

chronic, are those commonly received as indicative of hepatic disease; and that this last affection may commence by inflammation in the digestive tube." If any doubt exists as to the diagnosis, Dr. Stokes considers it better to give the patient the advantage of that doubt, and to treat him for gastro-duodenitis, before we have recourse to the hazardous plans usually recommended for hepatic disease. The reader will find much valuable information on the subject of enteritis, in *Dr. Stokes's* Observations.—Ed.

* Mém. et Recherches Anat. Pathologiques, p. 403, Paris, 1826. Dr. Stokes also represents pain in the right shoulder as an extremely rare symptom; a point on which he coincides with Andral and Dr. Mackintosh.—(Clinique Méd. and Elem. of Pathol. and Pract. of Physic, vol. i.) The editor has observed, however, that, in the *chronic* hepatitis, so frequent among the free living inmates of the great prisons which he attends, pain in the right shoulder is commonly complained of. In acute hepatitis, tenderness and swelling of the liver are also usual symptoms, the latter being easily detected when the bowels are empty; yet, as the observations of M. Louis prove, it is not a constant symptom.—Ed.

† From a table of cases of hepatitis, drawn up by Dr. Stokes, from the records of Andral, Louis, and the Meath Hospital, it appears that no explanation can be given of the reason for the presence or absence of jaundice, from any consideration of the state of the alimentary canal. We find, in the list referred to, cases of hepatitis with jaundice, in which that canal was free from disease; and the same symptom with gastro-intestinal inflammation; and with respect to the cases without jaundice, the stomach and bowels were healthy in some, and diseased in others.—See Cyclop. of Pract. Med., art. Liver.—Ed.

ituous potation: though often the cause is too obscure for detection. [Hepatitis is most common in the male sex, and is rarely met with in persons under the adult age.]

Dr. Saunders, and with some plausibility, suspects the acute variety is owing to an inflammatory state of the hepatic artery, and the chronic to a like state of the vena portæ. Winslow ascribes both to an inflamed state of the ramifications of the vena portæ,* which, in his opinion, constitute the seat of the disease; while Cullen refers us to the hepatic artery alone, and limits the seat of inflammation to its extremities. Dr. Heberden is not inclined to believe that the liver is primarily affected, but only influenced by a phlogistic diathesis, or preceding inflammatory fever.

If the inflammation originate in the peritoneal covering, the pain, as in most other cases of membranous affection, is peculiarly pungent, like that of pleuritis; the fever is severe, the tension very considerable, the pulse frequent, strong, and hard, the urine generally high-coloured. When the substance of the liver is primarily affected, the pain and pyrexy are far less acute, and especially at first; but they increase with the progress of the disease, or, in other words, as it extends to the peritoneal investment, the pain not only darting to the right shoulder, but sometimes as far as the throat and clavicle.†

Where the symptoms are most severe, and we have reason to suspect that the disease is confined to the peritoneal covering, the duration is often short, and the termination is in most cases that of resolution. But when less active, and seated in the parenchyma, it generally tends to suppuration; and if the convex side of the liver be the part affected, a tumour is visible externally, the cough becomes aggravated, and there is a difficulty of breathing.‡ If adhesions have preceded the suppuration, the pus points to the skin, and the abscess opens on the surface; but, if it break internally, it generally proves fatal by inducing a hectic; though sometimes, in consequence of fortunate adhesions below, the abscess discharges itself into the hepatic duct, and the pus is carried off by this channel. It has, occasionally, by the same means, made its way into the stomach and intestines, where the abscess has been very large: in which case, however, immediately upon the bursting of the abscess, the patient throws off, by sickness or by purging, a large mass of most offensive matter, and often dies in a few hours. In like manner, the pus has occasionally formed an empyema in the thorax; and, in a few instances, has been discharged from the lungs.*

The progress to a state of gangrene is sometimes very rapid, and especially in the swamps of the East and West Indies. Dr. Chisholm gives a striking example of this in a gentleman who, being "heated and profusely perspiring after violent exercise, lay down and slept in this state in a current of cool air. He awoke soon after in the most excruciating torture in the right hypochondrium, and with great tumefaction of the whole abdomen. In two days he was dead." The liver was found greatly enlarged, and reduced in many parts to a state similar to that of rotten cork.†

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* The inflammation and abscess of the liver, so common in phlebitis, are referred by Cruveilhier to the passage of pus, along with the circulating blood, into the minute ramifications of the vena portæ, in which it produces obstruction and irritation.—ED.

† The effects of hepatitis vary according to the intensity, duration, and situation of the disease. In general, the first visible effect is the production of increased vascularity of the parenchyma. In a more advanced stage, a softening of the substance of the liver is also observed, and there may be a deposition of pus or lymph on the serous surface. In this respect, according to Dr. Stokes, there is a great difference between the liver and the lung, as we seldom meet with pneumonia without serous inflammation, while the reverse often obtains in hepatitis; a consideration of vast importance in the surgical treatment of the disease.—(Cyclop. of Pract. Med., art. LIVER; also, Annesley's Dis. of India, vol. i., p. 406.) The rarity of adhesions in hepatitis, even after the formation of matter, is a fact which had been observed by Drs. Graves and Stokes, before Mr Annesley's work made its appearance.—See Dublin Hospital Reports, vol. v.—ED.

‡ Abscess of the liver, as an effect of acute hepatitis, is very frequent in India, but rather uncommon in temperate climates. In relation to suppuration of the liver, as it presents itself in our latitude, the reader will find the most interesting information in the writings of M. Louis (Recherches Anat. Pathol., Paris, 1826), and those of Drs. Graves and Stokes.—(Dublin Hospital Reports, vol. v.) The matter may be either diffused or in the form of numerous minute abscesses, or in that of one or more large accumulations, sometimes encysted; on other occasions merely bounded by the softened and yellow hepatic substance.—ED.

* Dr. Stokes has known abscess of the liver make its way, 1. Through the diaphragm into the lung; 2. Into the duodenum; 3. Into the cavity of the peritoneum. Dr. N. R. Smith, of the United States, relates a case, in which an abscess of the liver burst into the pericardium. With respect to the thorax, then, as Dr. Stokes has explained, the abscess may open into the lung, pleura, or pericardium; and, with reference to the abdomen, into some part of the alimentary canal, the peritoneal cavity, the gall-bladder, the vena cava, or kidney.—See Cycl. of Pract. Med., art. LIVER.

† Climate and Diseases of Tropical Countries, p. 64, 8vo., London, 1822. Mr. Annesley, who alleges that he has made as many post-mortem examinations of subjects destroyed by liver diseases as any writer on the diseases of warm climates, never met with an instance of gangrene of the liver; and he suspects, therefore, that the appearances which have been taken for gangrene, have been merely that black, congested, and softened state of the organ, which is sometimes observed in the more acute attacks of hepatitis.—(On Diseases of India, vol. i., p. 435.) Andral met with one clear case, however, of gangrene of the liver, the only example he ever saw; a sufficient proof of the rarity of such an occurrence. Here, as Dr. Stokes observes, is another circumstance, in which the pathological relations of the liver differ remarkably from those of the lungs.

The disease sometimes terminates in induration, which bears an extent in some measure proportioned to the range of the preceding inflammation, and may often be felt by applying the hand to the region of the organ. This, however, is a more frequent result of the second or chronic variety.

In order to induce acute hepatitis, it is necessary that the organ of the liver, at the time of attack, should be in a state of at least moderate health and vigour; for it is in this condition only that inflammation running through its regular stages can take place; and hence the acute variety is found far more frequently in temperate than in intertropical climates; and, in the latter, more frequently among new-comers than among those that have been long habituated to the climate, and whose livers have been weakened and relaxed by the greater heat of the sun: "Among the men of the eighteenth regiment," says Mr. Christie, who was stationed at Trincomalee, and had the care of the entire garrison in 1798, "I found, for the first six or eight months, the disease was much more frequent, much more violent in its symptoms, showed more tendency to suppuration, and was more sudden in its crisis, than with the Company's European troops, who had been long in India, although the latter were the most debauched. Among the natives, hepatitis does not often occur: out of a thousand native troops, I did not, in the course of three months, meet with more than two cases of liver complaints, which is comparatively a very small proportion."—(*Letter to the Editor of the Med. and Phys. Journ.*, May, 1798.) There is, however, a striking distinction between the state of the bowels, as affected by this disease in hot and in temperate climates. In the latter it is rarely we have any diarrhœa, and often an obstinate costiveness, the evacuations being mostly untinged with bile. In the former, from the higher degree of irritation that prevails, and the greater extent of its range, a bilious flux is so frequent as to be almost a pathognomonic symptom; and as the gorged vessels are apt to give way from debility, this is sometimes intermixed with blood.

In our own climate, bleeding at the commencement of the disease is generally found serviceable, and ought to be prescribed as speedily as possible; and be repeated, generally or locally, as the violence of the symptoms may require, and the strength of the constitution allow. Frank advises leeches to the hemorrhoidal vessels, or to the hypochondrium; but the lancet is alone to be depended upon.*

Free purging, with calomel and Epsom salts, should immediately follow; and mercury be at the same time introduced into the system by the stomach or by inunction, or by both. [Drs. Pemberton and Saunders gave the preference to saline purgatives; Dr. James Currie to mercurial ones, and especially to calomel. With respect to inunction, or an attempt to affect the constitution generally with mercury in the early and highly inflammatory stage of hepatitis, it was disapproved by the latter eminent physician, who used calomel at first only as an evacuant.*] From the costiveness that usually accompanies the disease, it is rarely necessary to unite the mercury with opium; though, where it irritates the bowels, the latter should unquestionably be given; as it should also to allay the cough, where this symptom is very distressing and prevents sleep. The mercurial course, as recommended by Sir James M'Grigor (*Med. Sketches*), should be steadily persevered in, not only in hot climates, but in temperate, till a salutary change has been effected, or salivation has been freely excited. It will often be found, however, that the patient will bear a long continuance of the mercurial plan without any affection of the mouth, and will gradually and insensibly improve under it; the soreness and tension subsiding, the cough diminishing, the pulse becoming slower, and the heat and dryness of the skin yielding to a pleasant moisture; all of which are prognostics of a favourable issue. In hot climates, however, little benefit is obtained from mercury till it has produced ptyalism; while, such is the still greater degree of torpitude under which the absorbents, as well as the excretories of the liver labour, that it is often almost impossible to excite this effect by the boldest practice. "I have myself," says Dr. J. Johnson, "taken calomel in twenty-grain doses, three times a day, without experiencing the slightest inconvenience from the quantity; nay, I often found large doses sit easier on the stomach, and occasion less irritation in the bowels, than small ones. At this time, too, I was using every exertion, by

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in which gangrene is not an unfrequent occurrence.—Ed.

* Dr. Stokes's experience would lead him to say, "that general bleeding has not the same marked influence over hepatitis that it has over peripneumony, but appears principally useful in preparing the patient for local depletion, which seems to have the most direct influence on the disease. We have seen a case where upwards of one hundred ounces of blood were drawn at different times, and in which no apparent effect was produced on the inflammation, until local bleeding was performed. In a robust adult, not less than thirty leeches should be applied, after the general bleeding, to the most painful part of the side," &c.—Cyclop. of Pract. Med.

* Twenty or thirty years ago, it was frequently stated, that mercury ought not to be given in acute inflammation of the liver, because it stimulated the organ; but that it was proper in chronic hepatitis. This doctrine is no longer respected in practice: mercury, given so as to bring on ptyalism, is generally conceived to be just as useful in acute hepatitis, as in any other form of active inflammation.—(See Elliotson's Lectures at London Univ., as published in Med. Gaz. for 1833, p. 482.) And Dr. Stokes observes, that, after the employment of general and local bleeding, the production of ptyalism appears to be the most powerful means of subduing the disease. He admits, however, that it is often difficult to excite ptyalism; and that the more severe the hepatitis is, the greater is this difficulty. As the best mode of ensuring the favourable action of mercury, he recommends the inflammatory condition of the organ to be diminished, as far as possible, before its exhibition.—Ed.

inunction, to forward the ptyalism, yet it was several days before I could produce any effect of this kind."—(*Influence of Tropical Climates*, &c., 3d edit., p. 174.)

The application of large blisters over the hypogastric region in succession is recommended by most practitioners, but I have not found them successful; and have evidently derived more benefit from fomentations, epithems, and the warm bath.

Diaphoretics should certainly form a part of the curative process; and they combine admirably with the mercurial treatment, particularly the antimonial preparations. Cooling, diluent, and even acidulated drinks, should be taken copiously; the diet consist chiefly of light farinaceous foods; and the chamber be well ventilated. If, from sudden shiverings, and remission of the quickened pulse, we have reason to believe suppuration has taken place, columbo, the mineral acids, and, above all, the bark, where it can be retained, should be given freely; the cinchona, at least in the proportion of from half a drachm to a drachm, five or six times a day; and this whether the abscess be likely to burst externally or internally; and, if the former, the direction should be encouraged by maturating cataplasms, and the abscess be opened as speedily as possible.* The discharge is sometimes very considerable in quantity, and amounts to several pints; the pus is occasionally found pure, but more generally intermixed with coagulable lymph, or some viscid, yellow fluid. It is at times lodged in different sacs, and hence subsequent tumours ensue, and subsequent openings are necessary.†

It is not always, however, even after suppuration has taken place, that the abscess must necessarily open in any direction; for, when we have full reason to believe that such a result has occurred, the fluid may be carried off by absorption, and the organ be restored to a sound state.

[A softening of the liver has been noticed by several observers, and among others by M. Lallemand (*Troisième Lettre sur l'Encéphale*, p. 351), in a case of very acute hepatitis attended with abscess. But M. Louis conceives, that, in the present state of our knowledge, a softening joined with increased intensity of the red colour of the liver, cannot be deemed a certain proof of inflammation, unless the organ contain at the same time pus, or the patient had, while living, icterus and pain in the right hypochondrium. In fact, as these two symptoms took place in four out of the five histories recorded by him, he believes they are rarely wanting.—(*P. Ch. Louis, Mém. Anat. Pathologiques*, p. 407.)]

Dr. Chisholm found this disease on one occasion contagious. It was at Grenada, in the winter of 1786, in districts peculiarly exposed to the influence of chilling northerly winds, and possessing large tracts of marsh. The disease was lamentably mortiferous, though the symptoms were insidious rather than violent. It usually destroyed in the course of six days; and the deaths were calculated at one in every six.*

In chronic hepatitis, all the specific symptoms, as already observed, show themselves obscurely. The pulse is something quicker than usual, and there is an obtuse pain in the region of the liver; but such as would not perhaps be noticed, if it were not inquired into, and the organ pressed upon, and connected with a sudden quick expiration after an attempt to inspire deeply: and there is also an indistinct uneasiness generally, though not always, about the right shoulder; all the symptoms becoming exacerbated at a certain period of the day, commonly about four o'clock in the afternoon. But, in conjunction with the proper hepatic symptoms, the most obvious are those of dyspepsy and atrophy; the appetite fails, the stomach is capricious, the animal spirits flag, and the flesh wastes away. The bowels are generally costive, and the stools often clay-coloured, though not always; and there is usually a sallowness on the skin, or a dirty greenish hue, which Dr. Darwin, from its resemblance to the colour of a full-grown silk-worm, has denominated *bombycinous*. The disease slowly advances to suppuration, or terminates in a scirrhous induration; but, in many instances, and especially after a habit of hard eating or drinking, is the index of a broken-up constitution.

Excess in eating and drinking, or indeed in any other voluptuousness, is the common cause of this variety of hepatitis in temperate regions,†

* The adhesion of the liver to the peritoneum, in cases of hepatic abscess, a circumstance so essential to the safety and success of the operation, is alleged to be rare. If such adhesion should not exist, the matter would pass into the cavity of the peritoneum, and cause an almost certainly fatal inflammation of it. To obviate this risk, Dr. Graves has proposed that an incision should be made over the most prominent part of the tumour down to the peritoneum, without dividing this membrane. The wound is to be kept open with plugs of lint, and poultices are to be applied. The desired adhesions will then form, and the matter soon make its way out through the incision.—(See Dublin Hospital Reports, vol. iv.) Dr. Graves gives one instance of the success of the practice, and Dr. Stokes has seen two others. The passage of the matter of an abscess of the liver into the cavity of the pleura or peritoneum, is, no doubt, generally fatal; yet, in the Report of the Meath Hospital, a case is recorded in which death from peritonitis was apparently prevented by the opiate and stimulating treatment, first proposed by Dr. Graves in certain cases of peritonitis. In a case also of double abscess of the liver, related by Dr. Stokes (Cyclop. of Pract. Med.), the patient lived eight days after the rupture of the second abscess into the peritoneum, and it was evident, on dissection, that the process of cure had commenced, the gelatinous effusion in many places having assumed an appearance of layers, and presenting large bloodvessels in its interior.—Ed.

† Recueil d'Observations de Médecine des Hôpitaux Militaires, &c., art. par M. Boucher, tom. ii., 4to. Paris.

* Climate and Diseases of Tropical Countries, &c., p. 66, 8vo., Lond., 1822. The circumstances mentioned in the text make it very clear that the disorder was not truly contagious, but epidemic. —Ed.

† In this country, chronic hepatitis is more com-

though it sometimes follows obstinate quartans. It is, however, a more frequent affection in hot climates, where, as already observed, it is far more apt to occur than the preceding variety. And it is on this account that we see so many persons returning annually to our own country, from the East or West Indies, with enlarged livers, irregular fever, indigestion, costiveness, fulness in the right hypochondrium, white stools, yellow complexion, dry cough, disturbed sleep, and dejected spirits; occasionally some of these symptoms being wanting, and occasionally others. In all such cases, the organ is torpid, yet irritable, and the cure must depend upon our ability to give it fresh tone and vigour. The general congestion is most effectually removed by smaller doses of calomel than advised in the acute variety, so as to produce an alterant effect, and gently excite the sluggish secernents into a state of renewed activity. Though here also ptyalism is aimed at in hot climates, yet in a milder degree than in the acute variety.* And, in conjunction with these, we are to employ warm aromatic bitters; and, where they agree with the stomach, the mineral acids. Dandelion, as recommended by Boerhaave and Bergius, has often been found serviceable. Dr. Pemberton paid much attention to its virtues, and had often seen it of decided advantage in incipient scirrhosities of the liver and other abdominal organs; and strongly recommended it in doses of half a drachm of the extract twice a day.—(*Treatise on the Diseases of the Abdominal Viscera.*) We cannot, however, always depend upon this preparation, and hence, as a general rule, it will be more advisable to employ the decoction. Where there is an evident tumour on the right side, a seton should be introduced over it.

In slighter cases, which have nevertheless compelled a return from India after a residence of eight or nine years, I have found all the symptoms vanish before a steady use of Plummer's or the blue-pill, taken every night for a month; and the Cheltenham air and waters, for the same period of time afterward.

Where a chronic inflammation of the liver has terminated in a scirrhus of the whole organ, or of a great part of it, the blood is obstructed in its circulation, congestion takes place in other organs, and we often meet with very extensive hemorrhages from the lungs, nostrils, stomach, or anus. These discharges are rarely, perhaps never, of service in chronic cases, and only contribute to weaken the system. But, in acute cases, constituting the first variety, by diminishing the phlogotic action, they are often of very essential use.

[Disease of the liver not uncommonly brings on a cough, which is sometimes so prominent a symptom, as to lead the practitioner to suppose the seat of disease to be in the lungs.*]

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mon than acute.—Bateman, in art. Liver, Rees's Cyclopædia.—Ed.

* Before employing mercury, Dr. Stokes applies twelve leeches to the region of the liver every third or fourth day, until the pain and tenderness are removed. Afterward he resorts to counter-irritation, with repeated blisters, or antimonial ointment. If these means do not succeed, he endeavours to affect the system gently with mercury, for which purpose he prescribes a small dose of calomel, or blue-pill, combined with Dover's powder, to be taken at night, or mercurial inunction over the region of the liver. When any thing in the state of the constitution forbids mercury, Dr. Stokes speaks favourably of the nitro-muriatic bath, or of sponging the surface of the body with this fluid. Frictions with the ointment of the hydriodate of potash on the right hypochondrium, and the internal exhibition of iodine, are also sometimes employed with benefit.—Ed.

* See Dr. Brooke's Case and Obs. on Liver Cough, in Trans. of the King's and Queen's College of Physicians, vols. iii. and iv.; and Sir Thomas Moriarty's Communication in the latter volume.

SPECIES XIV.

EMPRESMA SPLENITIS.

INFLAMMATION OF THE SPLEEN.

HEAT, FULNESS, AND TENDERNESS IN THE SPLENIC REGION; WITH PAIN UPON PRESSURE.

Of the use of the spleen, as observed in the Physiological Proem to the first class, we know little or nothing. It secretes no peculiar fluid except what serves to produce a change in its own blood, which is of a dark livid colour, and coagulates with difficulty. It is commonly supposed to be an organ auxiliary to the liver; and it is unquestionably subject to all its ailments: voluptuous living, however, and even the heat of a torrid sun, affect it less; but obstinate tertians and quartans more, and render it sooner congestive and scirrhous.

Inflammation of the spleen, together with the symptoms given in the definition, is accompanied with the usual pyrectic signs; and often with a pain extending over the whole of the abdomen, but particularly in the left side, and shooting from the diaphragm to the left shoulder. There is also not unfrequently a dry, short cough, and sense of constriction in the præcordia, sickness or nausea, and a discharge from the rectum of black or livid blood, from a rupture of some of the splenic vessels. It is, however, a rare complaint. "The spleen," observes Dr. Baillie, "is much less subject to inflammation than many other of the abdominal viscera. I do not recollect a strongly-marked case of it in my practice; and I have never met with an abscess in the spleen in all the dead bodies which I have examined."† The common causes of inflammation of the spleen are the same as those of the liver; and the treatment need not essentially vary, as the progress and terminations of the disease are not different. In India, where it is more common than in temperate climates,

† Lectures and Observations on Medicine, 1815. Unpublished. Notwithstanding these remarks, abscesses of the spleen,‡ and these of different kinds, have been met with by other anatomists, as may be learned by reference to the additions made to the subject of parabysma splenicum.—Ed.

‡ This remark of the editor is confirmed by occasional dissections in this country.—D

the native practitioners use acupunctures and scarifications.

The SPLENALGIA, or pain in the spleen, of many writers, is for the most part a slight attack of this disease, with some small degree of fever. For further observations on diseases of the spleen, see Parabysma Splenicum.

SPECIES XV.

EMPRESMA NEPHRITIS.

INFLAMMATION OF THE KIDNEYS.

PAIN IN THE LOINS;* FREQUENT MICTURITION; VOMITING; NUMBNESS OF THE THIGH ON THE AFFECTED SIDE; RETRACTION OF THE TESTICLE.

THE general causes of this species are whatever obstructs the flow of the fluids in the vessels of the kidneys; as a wound, contusion, tumour, strain of the muscles of the back that press on the kidneys, excess of horse-exercise, various acrids conveyed to the kidneys by the course of the circulation. It is, however, most frequently met with as a secondary disease, resulting from calculous matter blocking up the tubuli uriniferi, or from calculi formed in the pelvis of the kidneys, and obstructing that cavity or the canal of the ureters, concerning which we shall have to treat under the genus LITHIA, embracing calculous concretions in the urinary passages.†

The symptoms enumerated in the specific definition are sufficient to indicate the presence of nephritis, though the numbness and retraction of the testicle are common to calculi in the ureters, or body of the kidney, even when there is little inflammation present. In the case before us, however, the skin is usually hot and dry,‡ the body costive, and motion, and even an erect position, are accompanied with considerable uneasiness. By the last sign we may distinguish the disease from an inflammation of the psoas, or almost any other adjacent muscle; while the immediate seat of pain separates it from colic, even when it is attended, as it is occasionally, with ventral gripings.

When the disease is violent, the urine is discharged in small quantity, and of a pale hue. And hence, if the urine become higher coloured, be secreted in a larger proportion, and be at length thick and mixed with mucus, a gradual relief may be expected to follow, and the cure will be effected by a copious flow. The disease sometimes passes off also by a metastasis. But if the symptoms be protracted beyond the seventh day, and there be stupor or heaviness in the organ, instead of acute pain, with frequent returns of chilliness and shivering, we have reason to expect that an abscess will ensue: in which event the pus may be discharged into the pelvis of the kidney, the abdomen, or, in case of adhesions, externally through the integuments and the skin. The first is the most favourable issue, next to that of resolution; the last is often succeeded by a cure, but an evacuation of pus into the cavity of the abdomen rarely. In some instances the suppuration has been so considerable as to destroy the substance of the affected kidney entirely, and leave nothing but the external membrane.* Yet there are cases in which a patient has recovered even in this state, and the office of secretion has been performed by the sound kidney alone.

Gangrene occasionally ensues,† and it is indicated by a sudden remission or cessation of pain, after great violence of vascular action; accompanied with cold sweats, a sinking pulse, discharge of black urine, and other symptoms of approaching dissolution. Generally speaking, the cases of complete recovery are but few, though the patient often lingers, and even with an occasional prospect of recovery, for many months, or even years. "The formation of matter," observes Dr. Baillie, "will sometimes be suspended for several months, and patients will recover in a considerable degree their general health. The disease will return, either from imprudence in diet or exercise, or without any known cause, and the patient will become as ill as ever. It very rarely happens that a

* Usually experienced only on one side, and descending along the ureter to the bladder; frequently a good deal of uneasiness is also felt in the glans penis. The numbness is in the inner part of the thigh, in the course of the anterior crural nerve. The testicle is often swollen and tender, as well as retracted.—ED.

† Nephritis may be produced by cold, like any other inflammation, but it is rarely an idiopathic disease; it is more frequently the result either of mechanical violence, or of the action of turpentine or cantharides on the kidneys; or of stones lodged in it; or of a disposition perhaps to gout.—See Elliotson's Lectures, delivered at Lond. Univ., as published in Med. Gaz., p. 722, 1833.—ED.

‡ Dr. Cullen inserts pyrexia as a part of his definition of nephritis, and, according to the editor's judgment, very correctly; for, as Dr. Carter observes, all the other symptoms are common to both nephritis and nephralgia: indeed, the *pain* in the latter affection may be much more intense than in inflammation of the substance of the kidney, and quite as severe as when its capsule is inflamed; *but the pulse is little, if at all affected*, and the other signs of inflammatory fever are absent. But if, with the symptoms of the local affection, we find a frequent, hard pulse, a loaded tongue, great heat and dryness of skin, we may at once pronounce the disease to be nephritis.—(See art. NEPHRALGIA, &c., in Cyclop. of Prac. Med.) In a rheumatic affection of the loins, the pain is usually felt on both sides, extending to the hip, and, if down the thigh, not in the course of the anterior crural nerve, but in that of the sciatic nerve.—(See Elliotson's Lectures at Lond. Univ., Med. Gaz., p. 721, 1833.) There is no frequent desire to make water, no pain in the course of the ureter, no enlargement, no tenderness, no retraction of the testicle.—ED.

* The editor was once required to sound a patient in a case of this description, attended with symptoms very much resembling those of stone in the bladder. The patient was under the care of Dr. Smith and Mr. Baker of Staines. The former gentleman published some of the particulars of the disease in one of the volumes of the Lond. Med. Gaz. The quantity of matter was very considerable.—ED.

† See a Case by Dr. Turner, in the 4th vol. of the Trans. of the College of Physicians.—ED.

patient permanently recovers from this disease, and I do not at present recollect an instance of it."—(*Lectures and Obs. on Medicine*, 1825.)

In attempting a cure of nephritis, we should commence with copious bleeding, and we may most conveniently apply cupping-glasses to the region of the kidneys. Saline purgatives should follow; and then oleaginous or mucilaginous emulsions, with small doses of nitrate of potash, or tincture of digitalis. The last has often proved highly serviceable in taking off the arterial action that maintains the inflammation, and at the same time in augmenting the urinary secretion. The loins should at the same time be covered with a large folded flannel wrung out in hot water, and confined, as already described in the case of peritonitis; and copious emollient injections should be frequently thrown up the rectum, and suffered to remain there as long as the patient may be able to retain them. The rest of the treatment and regimen should be that of inflammation in general.*

SPECIES XVI.

EMPRESMA CYSTITIS.

INFLAMMATION OF THE BLADDER.

PAIN AND SWELLING IN THE HYPOGASTRIC REGION; PAINFUL OR OBSTRUCTED DISCHARGE OF URINE; TENESMUS.

The bladder is often irritated and inflamed by the lodgment of a calculus in it, by viscid substances that pass into the circulation, and particularly by cantharides, ardent spirits, and terebinthine essences or balsams. Idiopathic inflammation is not a frequent disease; yet it occasionally occurs; for the bladder is subject to the common causes of inflammatory affection. Its exterior serous coat, its muscular coat, and its internal mucous membrane may all be affected; or the inflammation may affect the muscular or mucous coat separately.† [Cystitis is sometimes brought on by gonorrhœa, the inflammation of the lining of the urethra extending to the mucous membrane of the bladder.]

If the lower part of the bladder be chiefly affected, the pain will extend to, and take the course of the perinæum. If the seat be in the neck of the organ, there will be a retention of urine with a constant urgency to evacuate; if in the fundus, the urine will flow stillatitiously, and without ceasing; the bladder will give a feeling of being constantly full; and the patient will be perpetually and fruitlessly striving to empty it. In this affection there is usually great restlessness and anxiety, with cold extremities, vomiting, wildness of the eyes, delirium, and other marks of great general irritation. Much heat and smarting are generally experienced in the urethra; the patient is troubled with continual tenesmus, and pressure on the hypogastric region occasions violent suffering. The disease runs its course with rapidity, and subsides, or destroys the patient, in a few days.*

It terminates, like all other inflammations, most favourably by resolution. But if this do not take place, it passes on to suppuration or gangrene; the diagnostics of both which are those already noticed in the preceding species. If suppuration take place, the pus may be discharged by the urethra, which is its happiest outlet; or it may follow the course of the ulceration, and be emptied into the cavity of the abdomen; or, if adhesions have been formed with the subjacent cellular membrane, it may work its way in a sinuous direction, and find an opening in some part of the perinæum. Of the last two terminations, the first is almost always fatal; and the second is extremely troublesome and tedious, though a cure is usually affected at last.

Repeated bleedings, aperients, and relaxants, with copious emollient injections, suffered to remain in the rectum as long as possible, form the chief part of the plan of cure. Blood should be drawn both generally and locally, and a large bladder about half full of warm water be kept constantly over the pubes. The warm bath has also been frequently of essential service.†

* I believe the best practitioners of the present day do not administer digitalis, nitrate of potash, and other diuretics, in cases of nephritis. With respect to purgatives, Dr. Elliotson prefers those of calomel. The warm bath is also more efficient than partial fomentations. In the event of suppuration, the treatment is to be regulated by the principles applicable to suppuration in general. Anodynes will be required, and uva ursi may be tried, though its virtues are rather doubted by many members of the profession.—Ed.

† In some observations on inflammation of the bladder, inserted by Mr. Coulson in the Med. Gaz. for 1833, an attempt is made to lay down the particular symptoms which characterize both these *varieties of cystitis*.—Ed.

* When the lining of the bladder is inflamed, the disease is very likely to be mistaken for stone. The following are the considerations specified by Mr. Coulson, as indicating the difference of one case from the other:—"The uneasiness in the bladder, frequent desire to make water, and the passage of blood with the urine, are symptoms of stone, as well as of this complaint. But in stone the pain is principally experienced after the bladder has been emptied; whereas, in acute inflammation of the mucous membrane of the bladder, the pain is most intense when the bladder is full, and subsides when it is empty: in stone, larger quantities of blood are passed than in this disease, and the urethra is seldom so irritable."—Med. Gaz. for 1833, p. 666.—Ed.

† To the remedies which are mentioned in the text for affections of the bladder, may be added the buchu. This plant (the *agusthosma crenatum* of Wildenow, the *diosma crenata* of Thunberg) has long been used by the Hottentots at the Cape of Good Hope for a variety of diseases, and was thus brought to the notice of the English and Dutch physicians, who have recently employed the buchu in Great Britain and on the continent. Very lately it has awakened the attention of practitioners in the United States. Dr. Francis informs me that he first became acquainted with this medicine from information given him by Dr. M'Lean, who had used it in a complex case with great success. Profiting by his remarks, Dr. F., within the last four years, has prescribed buchu tea in a number of cases of chronic catarrh of the bladder, of retention of urine in consequence of

When the urine is actually suppressed, it is usually evacuated by a catheter; but I would strenuously recommend, instead of this, a siphon formed upon the plan of that employed by Mr. Jukes for the stomach, and already described under *dysphagia constricta* (Class I., Ord. I., Gen. III., Spe. 1), with an elastic bottle attached to its outer end, and a stopcock adapted to it; so that, being introduced in its contracted or vacuum state, it may readily be converted into a powerful suction-pump by merely turning the valve. This instrument may also be rendered of great importance in another way; for by charging it with an emollient or anodyne fluid, when the bladder is empty, we may get such preparations to come immediately in contact with the inflamed surface of the bladder, in any degree of strength that may be advisable.*

SPECIES XVII.

EMPRESMA HYSTERITIS.

INFLAMMATION OF THE WOMB.

PAIN, SWELLING, AND TENDERNESS IN THE HYPOGASTRIC REGION; HEAT, PAIN, AND TENDERNESS IN THE OS UTERI; VOMITING; PULSE RAPID.

This species offers us two varieties, according to the condition of the organ at the time of attack:—

α	Simplex. Simple inflammation of the womb.	The organ unimpregnated. Pain permanent, circumscribed, throbbing; fever a cauma.
β	Puerperarum. Puerperal inflammation of the womb.	The organ having lately suffered childbirth. Pain less acute, less circumscribed; flow of urine difficult; fever a synochus or typhus.

The first of these is produced by cold, or any of the other ordinary causes of inflammation, and terminates in resolution, suppuration, scirrhus, or gangrene. The most ordinary termination is that of resolution, the next that of scirrhus, sometimes running into cancer: both which are far more common to women who have never been impregnated than to those who have had families, but rarely appear before menstruation, from the natural quiescence of the organ in this state.—(*J. P. Frank, de Cur. Hom. Morb. Epit.*, tom. ii., § 922, p. 217.) [One symptom is constant, viz., pain in the hypogastric region, which is increased by the slightest pressure, or on the patient's making a deep respiration. The urine is generally voided with difficulty, and in small quantities; and, as the rectum participates in the irritation, a distressing tenesmus is experienced. The bowels are mostly irregular, the tongue white, and the pulse rapid, small, and what some practitioners term wiry. The pain frequently extends with great severity to the loins, and sometimes shoots down the thigh; and, as the stomach sympathizes, there is generally vomiting.]

All the ordinary means already noticed for subduing inflammation, both general and local, should here be put into effect without loss of time; as, copious and repeated venesection, leeches, aperients, emollient injections, both into the rectum and uterus itself, and fomentations or epithems to the hypogastrium. The disease is sometimes relieved by a sudden flow of the menses, with hemorrhage or genuine blood.*

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weakness or diminished energy of this organ, &c. —and in most cases with the happiest results. It seems to possess several advantages not belonging to the remedies generally used. The buchu leaves are best given in an infusion made by pouring a pint of boiling water on an ounce of the leaves; which quantity may be taken in twenty-four hours. This article is mentioned satisfactorily in the excellent Dispensatory of the United States, by Professors Wood and Bache, of Philadelphia (second edition), 1834.—See also Manuel de Matière Médicale, par H. M. Edwards and P. Vavasseur, p. 362, Paris, 1831.—D.

* The plan of appeasing an inflamed bladder by injecting any kind of fluid into it, is one that is now renounced by all men of experience. On this point I will quote a short statement made by Mr. Coulson, in speaking of inflammation of the mucous membrane of the bladder:—"Some recommend the injection of oil and opium, and other substances, into the bladder, by means of a gum-elastic catheter; and in one of my patients this plan had been suggested by an eminent physician, prior to the patient being placed under my care; but no benefit was derived from this treatment. In fact, the pain and irritation which are experienced from the introduction of instruments into the bladder in these cases, are so considerable as to deter me from employing this plan."—(Lond. Med. Gaz. for 1833, p. 666.) This gentleman found some benefit produced by the decoction of pareira brava, after the severity of the pain had been subdued by other means; though he pronounces it to be more applicable to the chronic form of the complaint. He adds, hyosciamus, opium, lime-water, with sirup of poppies, may from time to time be administered.—Ed.

* Inflammation of the womb is sometimes attended with another disease, which has been much overlooked: we allude to *inflammation of the ovary*, which might very properly be introduced into this genus under the term Empresma Ovaritis.

Among the causes of this disease may be mentioned, inflammations of the uterus or of the peritoneum, difficult labour, repeated abortion, the indulgence in sexual intercourse before the proper period, shortly after parturition, or when convalescent from diseases of the uterus, disappointment in marriage, &c.

The most prominent symptoms of ovaritis are, pain in one or both sides of the abdomen, increased by pressure; this pain is more severe, also, when the patient walks, but is much less in lying down: sometimes, also, the affected ovary becoming enlarged, a tumour is observed in the side diseased.

Ovaritis is sometimes resolved, sometimes it becomes chronic, and sometimes it terminates in suppuration; the pus collects in an abscess, which opens in the anterior wall of the abdomen, in the Fallopian tube, the vagina, the peritoneal cavity, the bladder, and even into the intestines; it emerges through the vulva, the urethra, or the anus, or it remains incarcerated in a cyst. Mad. Boivin thinks that the adhesion of the inflamed ovaries to the adjacent parts seems to prevent conception, the development of the fetus, and to be a very common cause of abortion.

Ovaritis requires to be treated, like other inflammations, by bleeding, leeches, warm mucilaginous

The SECOND VARIETY, in which the symptoms are alike, but less acute, is usually, though not always, a result of suppressed lochia, or violence sustained during labour, particularly from the use of instruments: the inflammatory action from this cause often extends down the vagina, which is hot, reddened, tense, and tender to the touch; and sometimes the same effects descend so low as to be manifest externally. Bleeding is here to be avoided,* and the inflammation to be attacked with gentle laxatives, diaphoretics, and, where there is much irritability, camphire and opiates; fomentations and injections being employed at the same time.

It is a singular but well-ascertained fact, that the spleen, from some unknown cause, is peculiarly apt to sympathize with the action of the womb, and at times to run into an equal degree of inflammation, suppuration, or even gangrene; and especially in females of a high nervous temperament. And so common is this fellowship of action, that most of the cases of diseased spleen related by Morgagni, are accompanied with an account of some mischief existing in the womb or its appendages. It is, however, to M. Gastellier, of the Hospice de la Maternité, at Paris, that we are chiefly indebted for a knowledge of this peculiar sympathy, and especially in the case of uterine inflammation after childbirth. "La rate," says he, "en a été *souvent* frappée, mais une fois entr' autres elle a été entièrement détruite, entièrement fondue: il n'en restoit aucune trace, sinon un foyer de fluide sanieux, dans la région, et en place de cet organe."

This passage from M. Gastellier is quoted by Dr. Ley, in a case of a similar kind which lately occurred to himself in the Westminster Lying-in Hospital.—(*Med. Trans.*, vol. v., art. xx.) In this case, the preceding labour seems to have been perfectly natural, and without any difficulty whatever. On the third day afterward the disease seems to have commenced, indicated by intense pain over the whole of the abdominal region, with a slight sense of fulness, but without any considerable degree of tension. The patient sunk suddenly seven or eight days subsequently, and at a time when she was supposed to be in a state of improvement. On examining the body, the peritoneum and intestines exhibited little morbid affection of any kind, and the disease was found limited to the uterus and spleen; the peritoneal covering of both was slightly inflamed, but the internal structure of both had undergone a very extensive destruction. The whole surface of the uterus, when stripped of its tunic, was found to have assumed a gangrenous appearance, was extremely irregular, of a dark, livid hue, and gave forth a highly offensive vapour. The texture of the spleen was so changed as to resemble an extremely soft piece of sponge, and its cells were filled with an intimate mixture of pus and grumous blood.*

fomentations, and calomel. For further details on this disease, see Boisseau, Nosographie Organique, tome troisième, Paris, 1829, p. 803; Nouveaux Elém. de Pathol. Medico-Chirurgicale, par Roche et Sanson, tome première, Paris, 1828.—D.

* There does not seem to be any sound reason for this caution; bloodletting may often be considered as an effectual auxiliary to our means of relief.—D.

SPECIES XVIII.

EMPRESMA ORCHITIS.

INFLAMMATION OF THE TESTICLES

PAIN AND SWELLING OF THE TESTICLES; NAUSEA OR VOMITING; DEPRESSION OF SPIRITS; PULSE QUICK, SOMEWHAT LOW.†

INFLAMMATION of the testicle has generally been expressed by the absurd and unmeaning name of *hernia humoralis*; which, however, in its earliest use, applied to only one stage of the disease, namely, the suppurative, and imported an abscess or collection of pus in any part of the scrotum; and, in this sense, the expression occurs in Heister and Dionis, being precisely synonymous with the empyocele of the Greeks. I have revived the Greek term ORCHITIS, not only as being far more precise, but as accordant with the general termination of the specific names of the diseases appertaining to the present genus.

The inflammation seems commonly to commence in the tunica vaginalis, and to pass secondarily into the substance of the testis. Dr. Swediaur contends, that the testis never swells in the first instance, and that the disease always begins in the epididymis.‡ The causes

* Hysteritis puerperarum is, in fact, the disorder commonly, but improperly, called *puerperal fever*, and described in a former part of this volume, p. 414. Experience has now fully proved, that this disease is not necessarily and essentially peritonitis. This fact is clearly established by the evidence adduced on the subject by M. Tonellé, Dr. Conquest, and Dr. Lee. Dr. Conquest does not think, however, that the morbid appearances are always sufficient to account for death; for sometimes he has only found a Fallopian tube, or an ovary inflamed. In other cases, hysteritis, uterine phlebitis, gangrene of the uterus, and agglutination of all the pelvic viscera, are noticed in post-mortem examinations. For further information respecting the morbid appearances, see ante, p. 414, et seq. An excellent account of the different views taken by different men of eminence of the nature and best mode of treating puerperal fever, is given in Ryan's Manual of Midwifery, p. 635, ed. 3. His description might be much enriched by a notice of the valuable observations of Doctor Lee.—ED.

† The pulse is quick and hard; the skin is hot; the patient is constipated; and if blood be drawn from the arm, it presents a buffy covering, and its surface is cupped or excavated.—ED.

‡ According to Sir Astley Cooper, the first symptom of orchitis, when it arises from sympathy with the urethra, is an irritation of the membranous or prostatic portion of that canal, as if some drops of urine still remained in the beginning of the urethra; and this is succeeded by a tenderness in the spermatic cord at the abdominal ring, and by swelling and pain in the epididymis. The testicle next swells, and attains a considerable size, becoming at the same time so tender, that the pressure of the thigh against it can hardly be endured. Its weight is also much increased; the pain and swelling ex

are irritation in the urethra, or external injuries. The most common source of irritation is a gonorrhœa [which usually stops, or undergoes a considerable diminution, as the testis begins to swell.] Bleeding, leeches, puncturing the veins of the scrotum (*Sir Astley Cooper*, op. cit., p. 27), the recumbent posture, laxatives, and cold lotions, with a suspensory bandage, form the curative process.* [After two or three days, fomentations and poultices are the best applications.†] Yet we have already observed, that, when all local applications have proved ineffectual, the inflammation has been removed by vomits, in consequence of the close sympathy between the testis and the stomach.

This was a frequent practice of Mr. John Hunter (*On Venereal Disease*), and especially when the inflammation was the result of gonorrhœa. It was successfully employed for the same purpose, and is hence strongly recommended by Rhases (*Continent.*, lib. xi.), and is a common mode of treatment on the continent, particularly in Germany: after which opiates are often had recourse to, as well externally as internally. It may be worth remarking, that the affinity or play of action which thus prevails between the testis and the stomach, does not appear to be the common bond of union that is exhibited between the stomach, as the general centre of sympathy, and most other parts of the system; but a fellowship of a peculiar kind, and which, in fact, does not terminate in the stomach, but extends to the upper extremity of the alimentary tube, and exercises a very high degree of influence over the parotid glands, as is well known in E. PAROTITIS, and has been already noticed in discussing that disease. In treating of E. HYSTERITIS, I have had occasion to glance at the existence of a like sympathy between the uterus and the spleen: and the physiologist who has time for such pursuits, and judgment enough to guide him to a correct discrimination, would be engaged in no unthrifty employment, if he were to follow up, and arrange in a regular classification, these specific and mysterious relationships which single organs hold with single organs, and which are subordinate to the general harmony of the entire machine.*

tend along the cord into the inguinal canal; and a good deal of uneasiness is felt both in the groin and the lumbar region, especially when the inflamed testis is suffered to hang down unsupported. In severe cases, nausea and vomiting sometimes occur. It is remarked by Sir Astley Cooper, that the epididymis swells more in proportion than the testis, the globus major and minor being more affected, however, than the body of the epididymis, and the former generally very perceptible in front of the spermatic cord. In some cases the pain is periodically and severely increased by spasms of the cremaster muscle.—See Obs. on the Structure and Diseases of the Testis, by Sir Astley Cooper, Bart., 4to., Lond., 1830, p. 9.

* Tepid fomentations of vinegar and water, one part of the former mixed with four of the latter, will often be found very useful: the slippery elm-bark poultice is one of the best local applications.—D.

† Sir Astley Cooper, op. cit., p. 28. This excellent surgeon finds, that there are some constitutions in which depletion will not succeed in relieving orchitis, and, when the pulse is jerking, the patient irritable, and the part painful, he deems it the best practice to give the submuriate of mercury, with the compound powder of ipecacuanha. When matter forms, he recommends it to be discharged by puncture, as the tunica albuginea ulcerates slowly. Frequently the abscess is in the testis itself; often in the epididymis; and occasionally in the spermatic cord.—Op. cit., p. 30. —ED.

GENUS VIII.

OPHTHALMIA.

OPHTHALMIA. INFLAMMATION OF THE EYE.

PAIN AND REDNESS OF THE EYE OR ITS APPENDAGES; INTOLERANCE OF LIGHT; FLOW OF TEARS OR OTHER DISCHARGE.

OPHTHALMIA, from the Greek term ὀφθαλμός, "oculus," is obviously of very extensive import, and, from its radical signification, may be applied to any morbid affection of the eye, unless limited by common consent. Now, although a sort of common consent has been given, so as to restrain the term to inflammatory action, such consent has not been universally acceded to; and hence ophthalmia has been used in very different senses by different writers. Thus Sauvages, Linnéus, and Sagar employ it as expressive of any ache of the eye, without reference to pyrexy or inflammation. Among all these, therefore, it occurs under their class *dolores*, and runs parallel with cephalalgia, or cephalœa, ache or pain in the head. By Vogel, Cullen, and Macbride, it is limited to inflammatory affections of the eye; the two former arranging it as a genus, and the latter as a species. By Dr. Parr and Dr. Young it is also arranged as a species, and limited to a phlogotic action; the second denominating it ophthalmitis, consonantly with the common termination of names importing inflammatory diseases of a particular description of internal membranes and organs.

In the present system OPHTHALMIA assumes a middle rank: it is limited to inflammatory action accompanied with organic pain, but is arranged as a genus. It might possibly have been placed as a species under the preceding genus, EMPRESMA; but it has various characters peculiar to itself, as well in regard to its symptoms, as to the particular parts of the organ affected, which seem to entitle it to the rank of a distinct genus. And, thus explained, its real meaning will be found in the generic definition; the symptoms of inflammation common to the order, and entering into the ordinal definition, being

* It is remarked by Sir Astley Cooper, that when an acute inflammation of the testicle is sympathetic with the urethra, it rarely advances to suppuration; and he extends the same observation to other sympathetic inflammations. But, when orchitis is the effect of mechanical violence or vicissitude of temperature, suppuration may happen, though not frequently. The symptoms are then aggravated, and rigours occur.—Op. cit., p. 11.—ED.

always understood as a part of the generic character. [Yet, if the words of the definition be strictly adhered to, and no inflammations in the eye be regarded as species of ophthalmia, unless attended with redness and intolerance of light, certain cases, generally admitted to be such by the best modern practitioners, will be excluded. As Mr. Lawrence has correctly noticed, it is impossible to reduce into one description the characters of the various inflammations affecting the several structures of the eye. The truth of this must be evident, when it is recollected that the eye and its appendages exhibit, within a very small compass, a great variety of textures. We find in the visual apparatus, specimens of each of the three divisions of membranes, the mucous, the fibrous, and the serous; the conjunctiva, the sclerotica, with the cornea, and the surfaces containing the aqueous humour, corresponding respectively to each of those classes. It contains also nervous, muscular, and glandular parts; and, besides these, several tissues of peculiar structure, to which there is nothing analogous in other parts of the body; as the iris, the ciliary body, the choroid coat, and the transparent media. Each of the latter has its own characteristic structure; the cornea, the crystalline lens, the capsule of the lens, and the vitreous humour, resemble each other in being transparent. What similarity of character can we trace between inflammations of the conjunctiva, cornea, iris, and retina? Inflammation of the external tunics differs widely from that of the internal. Hence the attempt to embrace all these affections under one head, name, or definition, will only lead to confusion. It may be argued, indeed, that several textures of the eye are frequently inflamed together; yet the affection mostly begins in one, and, if duly treated, may often be wholly or principally restricted to it.* As, in a work of this kind, it can hardly be desirable to enter into a minute description of cases usually regarded as belonging to the department of the surgeon, the editor conceives that a notice of the following species of ophthalmia will suffice, the arrangement being founded on the structure and parts of the eye chiefly affected.

1. Ophthalmitis.	Inflammation of the whole Eyeball.
2. Ophthalmia Externa.	Inflammation of the External Tunics.
3. ——— Interna.	Inflammation of the internal parts of the Eye.

These species, with their varieties, will embrace as much of the subject as can be expected in a work of the present description, rather embracing physic than surgery. Staphyloma, ectropium, and entropium, which were arranged in the early editions as species of ophthalmia, though frequently attended with a greater or less degree of inflammation of the organ, are never considered by any of the best practitioners of the present day as ophthalmiæ. It is therefore only on the principle of their being often associated with a degree of ophthalmia, that their admission into the present genus can be at all justified. The editor, therefore, with some reluctance, suffers them to remain annexed to the foregoing species, and in the place assigned them by the author.]

4. ——— Staphyloma.	Protuberant and Opaque Cornea.
5. ——— Ectropium.	Everted Eyelid.
6. ——— Entropium.	Inverted Eyelid.

For the diseases affecting the SENSE of vision, and unaccompanied with inflammation, the reader must turn to the ensuing class NEUROTICA, Order II., in Vol. II.

SPECIES I.

OPHTHALMITIS.

INFLAMMATION OF THE WHOLE EYEBALL.

INFLAMMATION SEATED IN NO PARTICULAR TEXTURE OR COAT, BUT AFFECTING MORE OR LESS ALL THE TISSUES OF THE EYE; INCREASED SECRETION OF TEARS.

WHEN this general inflammation of the globe is fully developed, it is characterized by very considerable pain, increased external redness, more or less swelling of the part, increased lachrymal discharge, following, however, an earlier stiffness and dryness of the eye, and by redness and swelling of the upper eyelid. The pain is by no means confined to the front of the eye; but is deep-seated, and extends to the surrounding parts, as the brow, cheek, temple, and back of the head. The redness is at first inconsiderable, and seated in the sclerotic coat; but the conjunctiva soon participates in it, and the distention of its vessels produces the bright scarlet redness which conceals the faint pink colour of the sclerotica. The conjunctiva then begins to swell, and a deposition of lymph takes place, not only in the texture of the membrane, but in the loose cellular tissue that unites it to

* As Mr. Middlemore has well observed, the study of the diseases of the eye is peculiarly interesting; for in consequence of the superficial situation of some of its textures, and the transparency of others, an opportunity is frequently afforded of actually witnessing the morbid process. When the pleura is inflamed, we may infer, from existing symptoms, that serum is effused, that lymph is deposited, or that pus is secreted, as a consequence of such inflammation; but, if the conjunctiva, or any of the superficial textures of the eye are diseased, we can not only see their precise pathological state, but the product of such morbid condition.—(See Lectures on Dis. of the Eye, as published in Med. Gaz. for 1832-3, p. 136.) "Many of the diseases of the eye, and, generally speaking, those of chief importance, are very obscure in their symptoms on cursory examination, and, at the same time, rapidly destructive in their progress; and, unless they are very promptly detected, they may arrive at that degree which no remedies will then affect. To detect, therefore, the *degree* of inflammation, as well as the *particular texture* inflamed, affords, in many instances, the only chance of preventing the loss of vision." —Middlemore, op. cit.—ED.

the sclerotica. This bright scarlet elevation of the conjunctiva, projecting beyond and surrounding the cornea, firm, of considerable breadth, and acutely sensible, is technically called *chemosis*.

The access of light is very offensive to the patient; the pupil contracts to exclude it; and the eyelids are spasmodically closed. As the slightest attempt also to exert the organ produces severe pain, the patient keeps it as completely as possible at rest.—(*A Treatise on the Diseases of the Eye, by William Lawrence*, p. 74, 8vo., Lond., 1833.)

In the second stage, various alterations of structure are noticed. The iris becomes changed in colour, its brilliancy declines, and it no longer exhibits its usual motions in the varying degrees of light. The pupil contracts, and loses its clear black colour. The cornea becomes more or less opaque, and vision is lost. The alteration in the cornea, and in the state of the pupil, as Mr. Lawrence well observes, would account for imperfection or loss of sight; but the latter often occurs while the cornea is sufficiently clear for the transmission of light, and the pupil still open: hence, the evil is then to be ascribed to the mischievous effect of the inflammation on the structure of the retina; which effects, also, no doubt, generally exist, when the above specified causes of the interruption of the passage of light into the eye are present.

When the inflammation has attained its greatest violence, ectropium of the lower eyelid takes place, and a portion of the anterior surface of the eye projects in a denuded state, like a piece of red flesh.

To continue Mr. Lawrence's matchless description, here, however, considerably abridged, the mucous membrane of the eyelids becomes the seat of inflammation equally violent with that of the conjunctiva of the globe, becoming red as well as the skin, and the consequent swelling forms a large convex protuberance on the upper eyelid. The pulse is quick, hard, and full; the face flushed; headache is experienced; the skin is hot and dry; the tongue white; the appetite lost; the patient restless, and his nights sleepless.

The disorder, if not checked, is now attended with aggravation of all the general and local symptoms; the pain becomes throbbing, rigours occur, and suppuration of the eyeball follows; the cornea turns of a dull white, and then yellow colour. The agony is not relieved by the formation of matter, but continues for some days, until the cornea bursts, and the contents of the abscess are discharged, generally with the vitreous humour and crystalline lens. Matter is discharged for a time; the tunics of the eye collapse, shrink into the orbit, and the original form of the organ is completely lost.

When the disease does not proceed so far, the cornea becomes opaque, and remains so; the pupil is either closed or very much contracted, and the aperture filled by a newly-formed adventitious substance. Vision is either completely, or in a great degree lost; but the form of the eye remains.

The most favourable termination that can be expected, is the recovery of the organ, with the cornea clear, and the pupil open; still, in this case, as Mr. Lawrence has observed, the retina has generally suffered so much, that more or less of imperfection of vision is produced.

The present species of ophthalmia is characterized by its commencing, at one and the same time, in the external and internal tunics of the eye. Internal inflammation may spread to the external coats, or external inflammation may extend inwards; but, in this affection, both sets of parts are simultaneously attacked.

The prognosis, as delivered by Mr. Lawrence, is short and instructive. If the affection be seen early, and actively treated, you may expect to arrest it, and to prevent a change of structure in the organ, and consequent injury or loss of sight. But if the inflammation be fully developed, it can hardly be controlled, so as to preserve the powers of the organ unimpaired. When chemosis is actually established, the cornea clouded, the colour of the iris changed, and the pupil contracted, the patient will certainly lose his sight.

With respect to the causes of ophthalmia in general, our limits will permit us only to give a brief enumeration of them. Accidental wounds; surgical operations; and direct injury of the eye by various extraneous substances, mechanical or chymical stimuli, coming in contact with it; immoderate use of the organ; the influence of various states of the atmosphere; dense winter fogs; currents of cold wind blowing directly on the eye; exposure of the organ to vivid light, or its employment in the examination of luminous shining bodies. To use Mr. Lawrence's words, as the eyes are parts of an organic system, connected with the rest by vessels and supply of blood, by nerves, and by reciprocal sympathetic influences in health and disease, the remote and predisposing causes must be the same for them as for the rest of the body. One of the most important of these is fulness of habit, and, more technically, a plethoric condition of the system, arising from excess, or imprudent indulgence in the quantity or quality of food and drink. These indulgences produce and keep up an unnatural excitement, under which accidental circumstances more readily occasion disease, and that disease partakes more of the acute inflammatory character. The effects of all excesses at table will generally be aggravated, if combined with the unhealthiness of sedentary occupations in close and crowded dwellings. Another predisposing cause is the suppression of some habitual discharge, as that of menstruation. When, as Mr. Lawrence observes, we consider that, in a large portion of the community, all these predisposing circumstances are united with the direct exciting influence of excessive or injurious exertion of the organ, we shall cease to wonder at the numerous instances of inflammation in all the textures of the eye, that daily present themselves to our observation.*

* The annexed passage from Mr. Lawrence's work is introduced as conveying, in a small com

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In the treatment of all inflammations of the eye, the removal of the cause forms one of the most important and early indications; not, however, that we have it in our power always to trace the precise cause, or, when it is known, to remove it. Its removal, also, will not invariably prevent the disorder from making advance, though certainly it is one of the most likely means of having this desirable effect. Thus, if ophthalmia be excited by the lodgment of any extraneous matter, as a small insect, a particle of gravel, sand, &c., between the eyeball and lid, the extraction of such foreign body must scarcely require any knowledge of surgery to make its necessity plain to any common understanding; the removal of it in particular cases, however, demands surgical skill. The following directions, given by Mr. Lawrence, deserve to be recollected. In order to discover and remove any minute substance that has insinuated itself into the eye, you should first look attentively at the exposed surface of the organ in a good light; if you discover nothing there, you should proceed to depress the under lid, and bring the lower surface of the globe into view, by desiring the patient to look up to the ceiling. If you still find nothing, direct the patient to look in the opposite direction, and raise the upper lid, so as to bring into view the superior surface of the globe. In most instances, the extraneous substances lodge in the concavity of the upper eyelid, and cause exquisite pain. When they are thus situated, you must evert the lid. Take the cilia between your finger and thumb, and draw the lid downwards and forwards; press with a probe steadily against its upper part; then carry the ciliary margin upwards and backwards; you thus turn the lid inside out, and immediately see whether any extraneous body lodges there.* Particles of metal, imbedded in the cornea, should be removed with a cataract-needle.

Another indication is to protect the eye from injurious external influences. Thus, as Mr. Lawrence has observed, employment of the inflamed organ irritates it, and increases the inflammatory disturbance. The eye should therefore remain perfectly at rest; and even in slighter inflammation, active exertion of the organ should be discontinued, as in reading, writing, &c., although passive exercise of it may be permitted. This rule applies to the sound eye, when the other is the seat of violent inflammation. In the worst cases, the patient should be kept in a darkened room; but, in general, it will be sufficient to moderate the light by the ordinary Venetian blinds, and to protect the eye by the common pasteboard shade, covered with green crape or silk. The inflamed eye should never be exposed to cold air, in windy, rainy, or damp weather, and great vicissitudes of temperature should be avoided.

The preceding measures are only to be regarded as auxiliaries to the grand plan to be adopted for stopping the inflammation. To use Mr. Lawrence's expressions, it becomes necessary to institute early, and to follow up steadily,

pass, a great deal of useful information:—"The *common* or *idiopathic* inflammation, is distinguished from the *specific* or *sympathetic* inflammations, by the following circumstances:—1st, The principal symptoms, that is, redness, pain, swelling, intolerance of light, and lachrymal discharge, are equally developed, and present a correspondence in degree. In the *specific* inflammations, one symptom is commonly predominant over the rest. Intense external redness is seen in catarrhal ophthalmia, often without pain or intolerance of light; in *scrofulous* cases, the highest intolerance, with hot and acrid lachrymation, and spasm of the palpebral muscles, with hardly perceptible redness; in the *arthritic* and *syphilitic*, severe pain in the eye and its neighbourhood, with the other phenomena in a slight degree. In the forms just enumerated, the swelling is inconsiderable in comparison to the particular symptoms now pointed out; but is excessive in the purulent and gonorrhœal ophthalmiæ. 2dly, The symptoms commence at the same time, and in an equal degree, and continue in this equal proportion to each other throughout. Each symptom also exhibits this uniformity in degree and extension. The redness occupies equally the whole surface of the organ. In *catarrhal* and *strumous* cases it is partial, consisting in distention of some fasciculi of vessels, or confined to some part of the organ. In *syphilitic*, *rheumatic*, and *arthritic* ophthalmiæ, the redness is in the sclerotic coat, and usually forms a zone round the cornea. The pain in ophthalmitis occupies the whole globe and orbital region. In other ophthalmiæ, it is often less in the eye itself than in the parts round the orbit. 3dly, The course of the complaint is very regular, proceeding, when it has once begun, to its full development, unless it should be interrupted by active treatment. In the other ophthalmiæ, the *complaint* altogether, or particular symptoms, often undergo increase or diminution; in some, remissions, and in others, complete intermissions are observed. In catarrhal cases, the patient is often free from complaint during the day; the symptoms return in the evening, and are again diminished or lost in the morning. The symptoms of syphilitic ophthalmia undergo a marked diminution during the day, and show themselves again in severe nocturnal paroxysms. Scrofulous patients, on the contrary, suffer in the day, and are greatly relieved towards the evening. In these cases, too, recoveries and relapses occur suddenly, and succeed each other frequently. 4thly, True ophthalmitis is attended with considerable constitutional disturbance of inflammatory character, while the sympathetic ophthalmiæ are generally without fever, even in many instances where the inflammation runs high."—See Treatise on Dis. of the Eye, by Wm. Lawrence, p. 78.—Ed.

* See Lawrence on Diseases of the Eye, p. 99. "The directions given in books respecting extraneous substances in the eye, are in general of little use. Beer is tediously minute in describing every variety of matter by which the eye can be injured, and in laying down rules of treatment (Lehre, b. i., § 158); but he does not even mention the simple proceeding of everting the upper eyelid, which enables us to give the necessary relief in the majority of cases. Injections of water, milk and water, and mucilaginous fluids, under the lids and over the surface of the eye, are recommended: these are of no use, and, indeed, can only add to the irritation which already exists. If any injection could remove the foreign body, the flow of tears which its presence excites would be sufficient; when it sticks to the concavity of the upper lid, injections are wholly ineffective."—Op. cit., p. 101.—Ed.

bold and decisive antiphlogistic treatment, for the purpose of preventing any injurious changes in an organ, the perfect state of which is essential to the comfort and enjoyment of life. The disease must be arrested in its early stage, on account of its tendency to bring on the deposition of opaque matter, and to destroy the transparency of the pellucid textures of the eye. The pleura may become opaque, or adherent, without serious inconvenience; but the cornea cannot be deprived of its transparency, or the iris be rendered motionless (or misshapen by adhesions), without the functions of the eye being permanently injured or destroyed.—(*Middlemore's Lects., Med. Gaz. for* 1832-3, p. 136.)

Here local bleeding alone will rarely suffice; and the patient must be bled freely from the arm. In cases of inflammation affecting the entire globe of the eye, in inflammation of the external proper tunics affecting both eyes, or where it is very severe in one, general bleeding should be resorted to. Mr. Lawrence states, that a single large bleeding will, in general, be sufficient; but he is not inclined to measure the quantity of blood to be taken by ounces, but by the effect produced upon the system. He bleeds till the circulation decidedly feels the loss, and, in severe cases, where the eye is in danger, till fainting is produced.

The next mode of taking blood, in point of efficacy, Mr. Lawrence considers to be cupping, either from the back of the neck or the temple, especially the latter, from which part blood can be obtained quickly, and in large quantity.

Blood may be drawn by leeches applied as near to the eye as possible. The eyelids would be the best situation, were not this practice apt to produce an ecchymosis, that causes for a few days an unpleasant appearance. Copious bleedings by leeches, or cupping-glasses, are usually recommended from the temples; but it has been suggested, that the former may be employed with inconceivably more advantage, if applied directly to the mucous lining of the lower eyelid. We learn from Dr. Crampton, that this method has been pursued with almost universal success in the most severe cases in the Royal Military Infirmary at Dublin;* and it is said to have the great advantage of not being followed by that erysipelatous affection, which so often follows the application of leeches to the external surface of the eyelids, or even to the temples. This mode of using leeches may deserve more extensive trial.

In Mr. Lawrence's opinion, opening the temporal artery is less advantageous and convenient than cupping. We sometimes do not get blood enough in this way, and sometimes there is difficulty in stopping the bleeding. In active inflammation, the practice of scarifying the conjunctiva is decidedly condemned by him, and he thinks that there are very few cases of chronic ophthalmia in which it is beneficial.

The bowels are also to be cleared out by an active purge of calomel, combined with rhubarb, extract of colocynth, or jalap, and followed by senna, salts, &c. Antimony and nitre may afterward be given to keep up perspiration, and aperients to maintain regularity of the bowels. In all severe cases, the patient should be restricted to fluid, or spoon-diet; and, in milder attacks, fermented liquors and animal food ought not to be allowed.

After these measures have been adopted, blisters may be applied to the back of the neck, or behind the ear. Mr. Lawrence is of opinion, that, in active inflammation, they should never be applied nearer to the organ than these situations.

Large doses of tartarized antimony have been recommended, with the view of keeping up nausea and vomiting, and thus suddenly checking the progress of inflammation of the eye. It seems to have been practised by Dr. Dobson, of Kirkham, as long ago as the year 1773.—(*Edin. Med. Com.*, iii., p. 411.) While, however, Mr. Lawrence admits, that the plan diminishes the heart's action, lessens the force and frequency of the pulse, and certainly so far diminishes the degree of any local inflammation, he deems the remedy severe, and not to be depended upon.

After the abstraction of blood, and the evacuation of the alimentary canal, calomel may be given in doses of from two to five grains, alone, or combined with a small quantity of opium, and repeated every six or eight hours. The free exhibition of calomel, after depletion, is observed to have a very favourable effect in preventing the changes of structure, so frequently produced by inflammation.—(*Lawrence on Dis. of the Eye*, p. 111.)

This distinguished surgeon has little confidence in local applications; but he does not object to the use of saturnine collyria, or fomentations, the choice being regulated by the patient's feelings.

SPECIES II.

OPHTHALMIA EXTERNA.

INFLAMMATION OF THE EXTERNAL TUNICS OF THE EYE.

INFLAMMATION SEATED IN THE EXTERNAL TUNICS, ATTENDED WITH INCREASED LACHRYMAL DISCHARGE, IF IN THE SCLEROTICA AND CONJUNCTIVA UNITEDLY; BUT WITH MUCOUS, OR PURULENT DISCHARGE, IF THE INFLAMMATION BE OF A SPECIFIC CHARACTER, AND AFFECT PRIMARILY AND CHIEFLY THE CONJUNCTIVA.

As, under the term external ophthalmia, may be comprised all inflammations affecting chiefly, or primarily, the outer coats of the eye, the proper tunics, as well as the conjunctiva, and sometimes the eyelids, it is here proposed to notice the following varieties:

α Ophthalmia externa communis.	Inflammation of the external coats of the eye.
β Ophthalmia catarrhalis.	Catarrhal, or mucous inflammation of the conjunctiva.
γ Ophthalmia purulenta.	Purulent inflammation of the eye.

* Crampton on the Application of Leeches to Internal Surfaces; Dublin Hospital Reports, vol. iii., p. 223, &c.

δ Ophthalmia nosa. Psor-ophthalmia.	Gluti-	Affecting the conjunctival lining and edges of the eyelids.

The first variety, as Mr. Lawrence has observed, which is common, or simple inflammation in subjects otherwise healthy, varies considerably in degree, from slight congestion of the conjunctiva to acute inflammation of the same membrane, with chemosis, and similar inflammation of the sclerotica and cornea. Under its various degrees and forms, it has been designated by different names. *Taraxis* denotes the slighter cases; *ophthalmia angularis* refers to a particular seat of the disorder; *xerophthalmia* denotes the dryness of the organ in a particular stage of the affection; and *chemosis* is its most violent or dangerous form, on account of the particular swelling of the conjunctiva often attending it, and described in the foregoing section.

Common ophthalmia may be seated in the conjunctiva only, or in the sclerotica and cornea. Although both cases may, without impropriety, be called external inflammation of the eye, they are very different in their symptoms, progress, termination, and treatment.

Simple inflammation of the conjunctiva is, generally speaking, an unimportant affection. In consequence of its loose texture, the vessels of the membrane yield readily; there is little pain or inconvenience; and no danger to the organ. The firmer textures of the sclerotica and cornea yield to distention with pain and slowness; their vessels do not easily recover, so that inflammation is with more difficulty subdued; and the implication of the cornea, with the ready transition of inflammation to the iris, exposes the organ to serious danger.

The symptoms of inflammation affecting the external proper tunics of the eye, are redness, pain, intolerance of light, increased lachrymal discharge, with more or less febrile disturbance.

To pursue Mr. Lawrence's valuable description, the redness begins on the front of the globe, immediately round the cornea, where it forms a red zone. Numerous bloodvessels may be seen advancing from the posterior part upon the sclerotica, and branching out into numerous ramifications, which are at length lost in the red zone. In inflammation of the conjunctiva, the redness commences in the circumference, the anterior part being at first comparatively free from it, and the sclerotica retaining its natural white appearance. The character of the red teint differs remarkably in the two cases. The vessels distended in sclerotic inflammation, or *sclerotitis*, as it is frequently termed, are those seated immediately upon the sclerotic coat; they are therefore covered by the conjunctiva, and, being seen through that membrane, are of a dark rose-red, and sometimes almost of a livid hue, which forms a striking contrast to the bright scarlet teint of the vessels distended in conjunctival inflammation. The zone, seen around the cornea in the early stage, is also of a rose or pink colour. The redness is uniformly diffused through the sclerotic coat; and, when the inflammation is considerable, a dense arrangement of vessels may be noticed, lying under the conjunctiva, and occupying the whole surface of the sclerotic coat. In inflammation of the conjunctiva, the vessels are not only of a bright scarlet colour, but lie nakedly on the surface of the membrane. When inflammation, without being very violent, is seated in the conjunctiva and sclerotica at the same time, the marked difference in the situation and teint of the two orders of vessels is very manifest.

When the sclerotic coat inflames, the conjunctiva soon participates in the affection; and the cornea, without becoming opaque, assumes a kind of dull appearance. Other common symptoms are, a sense of stiffness and dryness in the eye in the early stage of the disorder; a burning or aching pain in the organ; a sense of tension, or pressure of it; and a feeling as if sand or gravel were in contact with it, and pain shooting to the back of the orbit and side of the face. Intolerance of light is a marked symptom from the commencement of sclerotic inflammation, and forms another striking contrast between this affection and conjunctival inflammation; for, in the latter, the patient generally opens the eye freely, and experiences no pain from the access of light.

If the inflammation proceed further, the cornea first becomes grayish, and, when chemosis occurs, it turns white, cloudy, and then yellow; a thick, viscid matter, that cannot be discharged by puncture, being deposited in its texture. An effusion of a similar nature also frequently takes place in the anterior chamber, constituting the case termed *hypopium*. Sometimes the cornea is perforated by ulceration; the aqueous humour escapes; the iris becomes adherent to the opaque cornea, with or without prolapsus; and vision is lost. Inflammation of the external proper coats, then, is distinguished by the redness being originally seated in the sclerotica; by the discharge being lachrymal, not mucous; by the pain and intolerance of light; and by the changes occurring in the cornea. In conjunctival inflammation, there is increased mucous discharge; little or no pain, nor intolerance of light, except at first; and seldom any affection of the cornea. According to Mr. Lawrence, the degree of danger to the eye will depend on the question, whether the inflammation extends to the cornea; and, if it does, on the degree of that inflammation. If the cornea be not involved, there is no risk; or, if the affection of that part be slight, we need not apprehend any injury of vision. The degree of sclerotic redness in the early stage is a criterion, from which we may form an opinion, whether it will be severe or otherwise. If the case proceeds to chemosis; if the cornea becomes gray or white; or, if matter be deposited in its texture, sight will be more or less impaired.

With regard to the treatment, it should conform to the directions given under the first species of the present genus; the extent and rigour of the antiphlogistic measures being regulated by the degree and violence of the inflammation.

The distinct nature of catarrhal ophthalmia,

and its origin from atmospheric causes or peculiarities, are expressed, as Mr. Lawrence has well observed, in the terms *cold* or *blight*, under which it is often popularly mentioned. The expression, *mucous ophthalmia*, designates the increased mucous discharge, which is one of its most striking characters. It is inflammation of the conjunctiva, either of the globe, or of the eyelids, or of both, caused by cold, and it corresponds to catarrhal affections of other mucous membranes, as those of the nose and its sinuses, of the fauces, trachea, and lungs. Catarrhal inflammation frequently goes through all these parts, and commonly so in influenza.

The symptoms of catarrhal ophthalmia, as described by Mr. Lawrence, are at first stiffness and smarting; some uneasiness on exposure to light; and external redness. When fully developed, the disorder is characterized by redness, increased *mucous*, not *lachrymal* discharge; inconsiderable pain, and no intolerance of light. The redness is superficial, and of a bright scarlet colour; and at first generally in patches, the whole surface not becoming uniformly red, till the disorder is fully developed. The redness begins at the circumference of the globe, and gradually advances towards the cornea; but, in the commencement, it is confined to the palpebral conjunctiva. Sometimes little ecchymoses appear on the conjunctiva, and sometimes small vesicles, called pustules, generally situated near the edge of the cornea; but there is nothing like chemosis.

When the lachrymal discharge, noticed in the very commencement, stops, its place is supplied by increased secretion of mucus from the inflamed membrane itself. This is at first thin, afterward becomes thicker, assuming a whitish or yellowish appearance, and sometimes resembling pus. Whenever catarrhal inflammation of the eye is at all considerable, the eyelids participate in the disorder; and a pain and sense of weight are felt about the frontal sinuses and antrum, with headache, disordered stomach, foul loaded tongue, and other febrile symptoms. In the daytime the redness is less; there is no pain nor intolerance of light; but, in the evening, the disorder undergoes an exacerbation.*

Catarrhal is distinguished from purulent ophthalmia by its much milder character; and Mr. Lawrence thinks that they differ rather in degree than in any other essential point, unless it should be proved, which he thinks is not yet the case, that purulent ophthalmia is contagious.

As the affection is not a serious one, and does not produce injurious consequences to the organ, venesection is not in general necessary; but, in a young subject of full habit, with both eyes severely attacked, a full bloodletting would be proper. In ordinary cases, cupping and leeches will suffice. An active aperient, and, if the tongue be foul, an emetic, will advantageously follow the loss of blood. Saline and sudorific medicines may then be given, and occasional purgatives. The patient is to be kept warm, take plentifully of diluent drinks, and no animal food, nor fermented liquor. The pediluvium, or warm bath, may be useful, and perhaps, after a few days, a blister on the nape of the neck. Where the case seems to depend on a disordered state of the alimentary canal, an emetic, and an active purgative containing calomel, or the latter alone, followed by mild aperients and low diet, will often suffice, without the abstraction of any blood. The best local applications are fomentations. The sticking of the eyelids together during the night should be prevented by inserting a little of the unguentum plumbi* between the tarsal edges in the evening. The eye will not require a shade, unless the light be strong and offensive. Cool air will also be pleasant to the patient's feelings, and tend to remove the sensation of sand in the eye.†

Purulent ophthalmia of adult subjects, the third variety of external inflammation of the eye, here to be treated of, is a case of the most acute kind, attended with an increased secretion, which, in colour and consistence, resembles pus. The affection begins in the lining of the eyelids; extends to the mucous surface of the globe; and, when violent and not checked, it soon attacks the cornea. The whole texture of the conjunctiva then swells and becomes thicker; its vascular texture is developed; and its surface acquires an intensely bright red colour. The mucous surface is rendered villous, pulpy, granular, like the secreting surfaces of the alimentary canal; and, from the secreting surface, thus developed, flows the puriform discharge. This form of disease does not, like others, produce suppuration within the eye.‡

* There are exceptions to this statement; a young lady in Bedford Place, whom the editor is now attending (Dec. 1833) for catarrhal ophthalmia, is always considerably better in the evening. This fact is noticed by Mr. Middlemore:—"Sometimes," says he, "the uneasiness occasioned by catarrhal ophthalmia is increased during the day, and much relieved during the night; or, if that be not the case, there will be a distinct remission and exacerbation of the symptoms at regular intervals."—Med. Gaz. for 1833, p. 314.—ED.

* ℞. Liq. plumbi acet. ʒss; ung. cetacei ʒj. Misce.

† Some practitioners resort to stimulating applications; thus Mr. Melin dropped into the eye a solution of the nitrate of silver, four grains to the ounce of distilled water twice a day.—(Report of Ocular Diseases, &c., Lond. Med. Phys. Journ. vol. liii., p. 184.) Dr. Ridgway used a stronge solution, ten grains to the ounce. Mr. Mackenzie also puts a large drop of a solution of the nitrate of silver into the eye, in the proportion of from two to four grains to the ounce; foments the eye twice a day with a collyrium of gr. j of the oxymuriate of mercury in eight ounces of water; and applies to the edges of the eyelids, at night, an ointment, containing gr. iss of red precipitate to the drachm.—(See Mackenzie's Practical Treatise on Diseases of the eye, p. 334.) Mr. Guthrie employs the nitrate of silver ointment, ten grains to ʒj. These stimulating local applications are alleged to supersede the necessity for bleeding. Mr. Middlemore says, however, that he cannot recommend the ung. nigrum for catarrhal ophthalmia.—Lect. on Dis. of the Eye, Med. Gaz., p. 316.

‡ Dr. Vetch never saw the formation of pus in the chambers of the aqueous humour from

The changes in the cornea are sloughing, ulceration, and opacity. The sloughing and ulceration often expose the anterior chamber, causing prolapsus of the iris, loss of the humours, and collapse of the tunics, so that not only the function, but the very form of the eye is destroyed.

The affection has been described under various names; as *purulent*, *Egyptian*, and *contagious ophthalmia*.

In the first stage, there is redness of the palpebral conjunctiva, with some stiffness of the eyelids; and a little whitish mucus is seen on the membrane; but this stage is seldom seen by the surgeon. The disease soon extends to the globe, in what may be called its second stage; and now we see it marked by high vascular action, and bright redness, great tumefaction of the membrane, and profuse discharge. Frequently, there are red patches, apparently of ecchymosis. The swelling of the conjunctiva on the globe often raises it in the form of chemosis, which is sometimes so considerable as completely to hide the cornea. At this period the whole eyelid swells, from an effusion of serum in its texture. At first, a stiffness is felt in the eyelids and globe; and then a sensation is experienced, as if sand or gravel were in the organ. As the inflammation extends to the globe, the pain becomes severe and excruciating; and is deep-seated in the eye, often with throbbing of the temples and headache. "I have seen (says the younger Dr. Frank) the bravest soldiers cry like children for a whole night; and have heard them declare, that they would readily allow the affected eye to be torn out, if they could hereby get rid of the pain."—(*De Peste, Dysenteria, et Ophthalmia Ægyptiaca*, 8vo., Vienna.)

In the third stage, there is a gradual remission of the symptoms: the swelling, pain, and discharge are lessened; the external œdema ceases; and the swelling of the conjunctiva being no longer counterbalanced, the palpebræ are everted, especially the lower.

A thickened and granulated state of the lining of the eyelids, with consequent opacity and vascularity of the cornea, are remote effects of the inflammation when it becomes chronic. Some unnatural redness of the membrane, with slight swelling, and a little discharge, often continues for a long time; and there is a great tendency to relapse.

If the cornea retain its natural transparency, we may expect to arrest the inflammation by vigorous treatment; if it be dull, and deep-seated pain in the eye and head announce extension of inflammation to the globe, the event is doubtful.

This is the disease concerning which so much has of late years been written by French and English surgeons and physicians; which proved so extremely destructive to the armies of both nations in their respective expeditions to the banks of the Nile; and the real nature and cure of which have been discussed in modern times with no small degree of acrimony in our own country, but at the same time with much benefit to the public, from the facts and the ingenuity which the controversy has brought to light. There appears little doubt, however, that it has occasionally existed even in our own day, in ships-of-war, antecedently to the expedition to Egypt, of which Sir Gilbert Blane has given two examples (*Select Dissertations*, &c., p. 215), though it does not seem to have been a subject of much attention at the time.

This disease was at first ascribed to the minute and glassy spiculæ of the sands of the Egyptian plains. But it has since been referred, either to a peculiar miasm generated in marshlands, or to sleeping on damp or swampy ground, with insufficient covering, and surrounded by a moist atmosphere. And as these causes exist in other parts of the world than in Egypt, the disease is noticed in other countries, and, as we shall presently remark, appears to have been known in former times. The most contested points, however, in the history of the disease, are, whether, after the disorder has been once produced by the above, or other unknown causes, the matter secreted by the conjunctiva be contagious or not? and whether the extensive spreading of the affection afterward should not be imputed to this circumstance, rather than to epidemic causes?

[The generality of practitioners now incline to the affirmative on both these questions. In a former edition of this work, it was observed by Dr. Good that the matter is impregnated with a specific contagion; and hence the disease is propagated with great rapidity between those who come in contact with each other by sleeping together, or using the same towels. He had known it to be caught by a surgeon's assistant, merely in consequence of syringing the eyes of a patient; a part of the discharge having, from the force of the syringing, spirted into one of the assistant's eyes, which was for some days in a state of danger. Sir Patrick M'Gregor (*Trans. for the Improvement of Med. Knowledge*, vol. iii.), in the account which he has given of this affection, as it occurred in the Royal Military Asylum, mentions three instances in which the nurses of the establishment caught the disease, either while syringing the eyes of patients, or from having employed sponges used by the children.

It is curious to find, however, that Assalini, and all the surgeons who accompanied the French expedition to Egypt, never entertained any belief of the contagious nature of the disease. Not long since, Mr. Lawrence also regarded the doctrine of contagion as involved in doubt. In support of the opposite view he remarks, that in all cases where collections of individuals labouring under it have been separated or dispersed, as when troops are disbanded, and go into civil life, the complaint is put a stop to, and does not extend itself. Now,

lent ophthalmia (On Dis. of the Eye, p. 64); and a similar remark is made by Mueller (Erfahrungssätze, p. 68; see also Lawrence on Diseases of the Eye, p. 180). Yet, Mr. Middlemore speaks of suppuration of the eyeball as one of the occasional results of the disorder.—See Med. Gaz. for *1833, p. 410.*—Ed.

if it were contagious, and capable of producing a like disease in others, we should suppose that this would be the very way to spread it all over the country; but we find it the most effectual mode of putting a stop to the disorder. There is no dissemination of the complaint in the families or districts to which the soldiers, or other persons so afflicted, return. Yet, in opposition to this statement, it is to be remembered, that the extraordinary and increased prevalence of purulent ophthalmia in the army and elsewhere in this country, since the return of our troops from Egypt in 1801, is ascribed to the importation of the infection by soldiers labouring under the disease. If a healthy regiment also enter barracks which have been quitted by another corps, more or less afflicted with the complaint, experience proves that the new-comers are almost sure to suffer. If the facts of inoculation by contact, mentioned by Sir Patrick M'Gregor, Mr. Middlemore (*Lectures on Dis. of the Eye, in Med. Gaz.* for 1833, p. 410), and Dr. Good, be unimpeachable, such affirmative amounts to a proof of the infectious character of the disorder, and cannot be in the slightest degree invalidated by the result of Mr. Mackesy's (*Edin. Med. and Surg. Journ.*, vol. xii.) bold experiment of applying to his own eyes a rag, soaked in the purulent discharge from the eyes of three of his patients, but without contracting the disease.

Mr. Lawrence does not, however, venture so far as to assert, that purulent ophthalmia is not contagious; but merely that it is a point requiring further proof. He considers, that there is abundant evidence that the disease arises from other causes than from the application of matter from the eyes of one individual to those of another. Many patients went to the Ophthalmic Infirmary, in whom he could trace no connexion whatever with persons labouring under the same affection, and yet they had decided purulent ophthalmia. According to his experience, purulent inflammation may be produced by the action of common causes, without the application of any morbid matter to the eye. But, when it is once produced, it is capable of propagating itself, under particular circumstances, in a way which we cannot easily distinguish from a contagious propagation. When individuals are crowded together in great numbers in confined habitations, sleeping in the same rooms, and using the same linen and the same utensils, and not carefully attending to personal cleanliness, deleterious influences on human health are known to be produced, though their nature and mode of action are obscure. The bad effects are increased by unwholesome diet, insufficient clothing, and inadequate ventilation. Hence, the only instances of the disorder spreading extensively and virulently, have been in barracks, ships, schools, prisons, and workhouses.*

In the treatment of purulent ophthalmia, two indications present themselves: the first is, to check the inflammation by antiphlogistic means; the second is, to restore the altered texture of the conjunctiva to its natural state by the use of astringents. In this manner, not only may the ulceration of the cornea and other destructive effects on vision be prevented, but, as Mr. Lawrence observes, you will also avert that chronic thickening and granulation, which are so obstinate and troublesome.]

The earliest mode of treatment pursued by the French, as we learn from the account of Dr. Antonio Savaresi, as well as of Dr. L. Frank, consisted in little more than the general treatment of the common acute ophthalmia; as bleeding from the jugular vein or temporal artery, blisters, saline purgatives, anodyne lotions, and a low diet. The bleedings, however, do not appear to have been very copious. And yet the first writer tells us, that, by this process alone, he was so fortunate, that, out of a thousand or thereabouts, who were confined to the French military hospitals in Egypt under his care, not more than two lost their sight completely, though some others suffered the loss of one eye.

In the hands of our own army practitioners, the plan of treatment, thus limited, completely failed; and the bleeding, which was almost solely depended upon, was carried, from the first day of the attack, and repeated for several days afterward, to as great an extent, not only as fainting, but as life itself would allow. The first accounts we had of this practice seemed to show that it was in the highest degree success-

* "If contagion exist," says Mr. Lawrence, "it must be very different from that of smallpox, scarlet fever, or measles; much less active and certain. At the same time, when I look to the instances in which the affection has prevailed extensively; when I see how the disease has gradually spread through large bodies of men, and how effectually its progress has been arrested in so many cases by insulating the diseased, and preventing all intercourse between them and the healthy, *I feel fully satisfied that the disease is contagious under certain circumstances and conditions.*"—(On Diseases of the Eye, p. 200.) Mr. Middlemore makes the following inferences:—1st, That contagion alone will not, except in very rare instances, produce this form of purulent inflammation of the eye, but requires to be aided in its operation by constitutional susceptibility, want of cleanliness, disordered health, exposure to a brilliant sun, or the damp night air, or to dust, or to peculiar conditions of the atmosphere, &c. All, or any of these circumstances, he thinks, will ensure the operation of contagion. 2dly, Purulent ophthalmia may arise without the aid of contagion, as occurs in many instances of relapse, and in some of those cases in which one eye becomes affected as soon as the other has nearly recovered; and, finally, the disease has occurred to a ship's crew during their voyage, whose eyes were not affected at the commencement of the voyage, nor until some time afterward and who had no communication with the men of any other vessel until the completion, or nearly the completion of their voyage.—(See Med. Gaz. for 1833, p. 411.) It seems manifest, then, that the disease may begin as an epidemic, and, under certain circumstances, at least, propagate itself also by contagion. In the same way, the Asiatic cholera is now commonly believed to extend itself, both as an epidemic and as an infectious disease.—ED.

ful:* but later experience has not justified the representation, and the extensive lists of blind pensioners supported by the Chelsea and Greenwich Hospitals, are a sufficient proof that the success of the evacuating plan was considerably exaggerated. A free abstraction of blood by leeches applied to the conjunctive tunic itself, does not appear to have been tried till of late by Dr. Crampton, in the Dublin Hospital, where it seems to have been of very decided advantage when employed in the first stage of the disease.

[Although bleeding seems not to have been invariably capable of checking the disease, the reason of this may perhaps have depended upon its not being combined with the seasonable employment of other judicious measures, and the impossibility of invariably removing soldiers from those influences by which the disease is kept up. Certainly, at the present day, and in this metropolis, purulent ophthalmia is treated with great success, which is in a great measure ascribed to free bleeding in the early stage. Mr. Lawrence recommends copious venesection, so as to produce syncope, as the first proceeding.† If the symptoms remain urgent, he advises the bleeding to be repeated. Subsequently, cupping may be practised on the temple, or numerous leeches applied round the eye, and repeated. Mr. Middlemore prefers placing them close to the tarsal margin of the lower eyelid. Cold or tepid washes should be used. Brisk purgatives in the first instance, and afterward milder aperients, will be necessary, with low diet and rest. After these plans have been adopted, blisters are to be employed. Such means are to be repeated and continued till the œdematous swelling of the eyelids, the chemosis, and the pain are reduced. The conjunctiva will now grow paler, and assume a relaxed and flabby appearance, the discharge still continuing in abundance.

In this stage, astringent lotions are to be applied to the organ, tonic medicines prescribed, and a better diet allowed. Mr. Lawrence prefers, at first, a solution of alum, and afterward one of the nitrate of silver, or the undiluted liquor plumbi acetatis. Two or three drops of either of the latter liquids should be introduced between the eyelids twice or thrice a day, and the eye may be bathed occasionally in the intervals with the alum lotion. The ung. hydrarg. nitrat. may also be applied to the edges of the eyelids at night. Mr. Guthrie, as is well known, is in the habit of using a strong ointment, composed of 10 grs. of the nitrate of silver, mixed with a drachm of lard, or the ung. cetacei, in nearly every form and stage of inflammation of the conjunctiva, attended with increased discharge from its surface. As an early application, however, it is disapproved of by Mr. Middlemore, though he admits that the stimulating plan is extremely useful, as soon as the acute symptoms are subdued.—(See *Med. Gaz.* for 1833, p. 412.) Then also, bark, cascarilla, and dilute sulphuric or nitric acid, with occasional aperients, are the best medicines. At first surgeons should carefully watch the effect of astringents; for, if the pain continue after their use, with an increase of redness, they must be left off, and antiphlogistic measures be resorted to again.

When the cornea is in a sloughing or ulcerating state, accompanied with debility, the patient should have wine, porter, good diet, and the sulphate of quinine, and use local astringents.]

The late Mr. Saunders was the first in the present day to discover that the blindness which is so apt to follow, even after the first attack of virulent inflammation has subsided, proceeds from the friction upon the transparent cornea of innumerable irritating granulations, as he denominated them, thrown forth from the surface of the tunica conjunctiva that lines the interior of the palpebræ, and which become a new source of inflammation, less violent, indeed, but as fatal in its effects; and the disease has hence been very correctly divided into two stages, that of primary and that of secondary or apparently granulating inflammation. Mr. Saunders endeavoured to cut the disease short in its first stage by exciting nausea, and maintaining it for a considerable period of time, so as to lower the living power, and hereby take off the inflammatory action. And where the disease had proceeded to what he called the granulating stage, he removed the minute caruncles from the tunica conjunctiva by cutting them off with a pair of scissors, and afterward applied a solution of nitrate of silver to prevent their sprouting again. Instead of the nauseating process employed in the first stage, Sir William Adams boldly prescribed active and powerful vomiting, continued for eight or ten hours, by giving two grains of tartar emetic at first, and continuing one grain every half hour afterward, through the whole of this period; by which violence a change of action, or new but more manageable excitement, is often produced in the eye, and the disease is stopped in the course of ten or twelve hours from its onset. The editor need scarcely observe, that, though most inflammations may be checked by the emetic treatment, the plan is severe, and less to be depended upon, than free bleeding and other antiphlogistic remedies.]

Where the second or granulating stage has commenced, Sir William Adams used to cut away the diseased surface of the conjunctiva, instead of the granulating points alone; by which the morbid action is destroyed, not only with less pain, but far more radically and effectually; and he afterward employs a solution of alum, instead of a solution of nitrate of silver, as the latter is hereby rendered unnecessary; not to mention that the agony it excites is often intolerable, and that a new inflammation has

* Account of the Ophthalmia which has appeared in England since the return of the British army. By J. Vetch, M. D.

† "If the symptoms be severe, and the patient tolerably strong, bleed until the pain is relieved, the chemosis diminished, and the sense of tension and throbbing removed."—Middlemore, in Med. *Gaz. for* 1833, p. 411.—Ed.

followed, in some instances, almost as dangerous as the original inflammation itself. Emetics, indeed, have long been occasionally made use of as a means of relieving inflammation in the eyes, but not in the particular kind before us, nor perhaps at any time of the inflammation with the precise object in view proposed by Sir William Adams. Stoll, for instance, employed them successfully in periodic ophthalmiæ (*Nat. Med.*, part ii., p. 102); and Dobson, as already observed, in ophthalmiæ of a like chronic kind, accompanied with nervous debility; the bark being interposed between their repetition. —(*Med. Comm. Edin.*, vol. iii, p. 444.) The nearest approach, however, to this practice, which I have met with on medical record, is Dr. Dobson's case, already noticed in the foregoing pages.

Yet, though the emetic plan carried to this extent, and employed for the express purpose just stated, does not appear to have been had recourse to in this form of ophthalmia till our own day, it has been very clearly shown by those who have critically and historically examined into the subject, that this very affection was long ago known to the world, and has been rationally as well as successfully treated in different ages. As the Greeks were much better acquainted with Egypt than ourselves, it is hardly to be supposed that it could have escaped their notice, and it has hence been suggested, with much probability, that it is referred to by them under the term PLADAROTIS (*Galen. Isag.*, 215, c. 6, vol. v., fol. 1542); while it is ingeniously affirmed by a learned critic of our own day to have been described by the old surgeons of our own country under the expressive appellation of the MULBERRY EYELID.—(*Quart. Journ. of For. Med.*, vol. i., p. 403.) There can, however, be no question that the ophthalmia before us was well known to them under whatever name described; and that even the *granulations* of the second stage, as they are incorrectly denominated, and which are rather enlarged and indurated cryptæ of the conjunctiva, had not only been noticed by them, but were even removed by some of the most approved methods of modern surgery; since it is expressly recommended by Read, who flourished nearly a century and a half ago, that, "if they be thick and gross, they must be cut away dexterously with the point of a lancet, and afterward let the place be touched with a little fine salt, alum, or copperas-water."* This, however, is not mentioned with a view of deducting from the merit of Mr. Saunders or of Sir William Adams; since the practice, and even the name of its original inventor, seems to have been long lost sight of in the annals of chirurgical science, and consequently the revival of such a practice, and a detection of its benefits, are as much a discovery now as it was in the time of Read. [At the present day, the practice of cutting away the granulations is less frequently adopted than that of touching them with nitrate of silver or sulphate of copper; experience having proved that they are more apt to grow again after the use of the knife or scissors than after that of astringents* or mild escharotics. The eversion of the eyelid, frequently remaining after an attack of purulent ophthalmia, may also be speedily cured by touching the surface of the thickened conjunctiva with these applications, which have the effect of restoring to it a healthy surface. The plan, however, is only right in the perfectly chronic stage, or rather a stage subsequent to those of the original complaint.

With respect to the *purulent ophthalmia of new-born children*, it usually comes on within a week from birth. Both eyes are mostly affected, but they are not first attacked exactly at the same time. In the first stage, it is confined to the mucous lining of the eyelids, which are remarked to adhere together when the child wakes. Their edges are redder than natural, especially at the corners; and the access of light to the eye produces pain, and makes the child shut it. If at this period the eyelids be everted, their lining will be found to be red and villous, and a little white mucus will be seen lying on the inside of the lower eyelid.

In the second stage, the inflammation extends from the palpebral conjunctiva to that covering the eyeball; the vascular congestion and redness are much augmented; the eyelids swell and become red even externally; from the inflamed membrane there is a copious secretion of purulent fluid, which glues the edges of the eyelids together, and then accumulates under the latter parts, or pours out over the face, staining the cap and linen. As the light is very painful, the child keeps the eye constantly shut, even if the swelling of the eyelids should not already close it. In this second stage, the whole of the conjunctiva is swollen, of a uniform bright scarlet colour, and presents a villous surface. It is further remarked by Mr. Lawrence, that the close adhesion of the membrane to the tarsi prevents the palpebral conjunctiva from swelling much; but the loose folds between the lid and the globe become greatly enlarged, forming red tumid rolls, finely granulated. These folds, pressed on by the orbicularis, evert the tarsi, causing ectropium of one or both eyelids. This eversion particularly takes place when the child cries, or the surgeon attempts to examine the eye by separating the eyelids. Sometimes the upper eyelid is so swelled that it hangs completely over the lower. During the night, the eyelids become so adherent to each other that they cannot be opened in the morning till after they have been soaked with warm water. When they are separated, the eye is completely concealed by the discharge; we wipe it away with a soft rag, and

* Short but exact Account of all the Diseases incident to the Eyes, Lond., 2d edit., p. 96. 1706. See also Quarterly Journ. of Foreign Med., ut supra.

* Mr. Lawrence gives the preference to solutions of alum, sulphate of copper, or lunar caustic, or the liquor plumbi acetatis.—On Dis. of the Eye, p. 216.—ED.

there is still enough to cover the globe and hide the cornea. If the disease should not be checked, it extends to the cornea, and thus may reach the interior of the globe. Some one or more of the following changes are now produced: general or partial sloughing of the cornea; ulceration or opacity of the same part; adhesion of the iris to the inflamed or ulcerated cornea, or suppuration of the eyeball, which last occurrence, Mr. Middlemore says, has been denied by Mr. Saunders on very insufficient grounds.—(*Middlemore's Lect. on Dis. of the Eye, as published in Lond. Med. Gaz.* for 1833, p. 508.) In the third stage, there is a gradual abatement and cessation of all the symptoms; the redness, swelling, and discharge are diminished; the child opens the eyes more readily to the light; and no ectropium takes place. The opportunity of seeing whatever changes may have been produced by active inflammation is now afforded.

When the complaint is severe, the infant becomes restless, and its bowels are disturbed; and the sloughing stage is attended with paleness and debility.

With regard to the causes of purulent ophthalmia in infants, it appears, that in a large proportion of instances, the mother is affected with some kind of vaginal discharge, to which the child's eyes have been exposed during parturition. Hence the natural inference is, that the disorder is excited by the actual contact of the matter: and the tolerably regular appearance of the disease on the third day corroborates this notion. Indeed, some facts mentioned by Mr. Lawrence and Mr. Middlemore* also tend to confirm this view of the subject. Yet, the former observes, purulent ophthalmia is often seen in children of healthy mothers, or mothers who at least declare themselves to be free from any kind of discharge. A declaration of this sort, however, coming from a woman whose child is attacked about three days after birth, is of course incorrect. Whatever may be the fact with regard to contagion being an exciting cause of this purulent ophthalmia, Mr. Lawrence adverts to other circumstances, which undoubtedly promote its occurrence. He says, that it is most frequent and destructive in weakly children, and such as are exposed to bad air, cold, insufficient clothing, and deficient nutrition. It is more frequent in premature children than in those born at the full time; in twins than in single children; in newly-born infants than older children; and in those than in adults. It is more frequent in damp and cold than dry warm weather; and among the children of the poor than those of the upper classes. In the Foundling Hospitals of Paris, Vienna, Petersburgh, and Moscow, which receive all infants presented, the disease is particularly prevalent and unmanageable.

When the cornea remains clear, the prognosis is always favourable; but if this membrane has sloughed, or ulcerated extensively, loss of sight is unavoidable. Even if the cornea be of a dull white, or has begun to lose its transparency, vision may be lost or injured, as it is most likely that ulceration and prolapsus of the iris, or permanent opacity will ensue.]

I cannot say that in any instance that has fallen within my own range of practice, I have seen all the benefit from the use of Bates's powerful and stimulant astringent, known by the name of aqua camphorata, which Mr. Ware ascribes to it. I have known it at times check the discharge, but do almost as much mischief from the pain it excites, and the irritation produced by very long fits of restlessness and crying, which are sure to follow.

The plan that has proved most effectual, in my own course of observation, is to syringe the eyes thoroughly, so that the whole of the purulent discharge may be washed out, with a solution of alum in water, in the proportion of not less than a grain to an ounce: to continue this syringing three times a day, to keep the bowels open, scarify the gorged vessels of the conjunctiva where it can be done, or apply leeches to their under surface, and surround the forehead lightly and loosely with folded linen, wetted with a lotion of an ounce of the liquor ammonia acetatis mixed with seven ounces of water, and kept cold in a bucket of ice. [Mr. Lawrence has seldom found it necessary to use more than one leech, which he applies to the red swelling of the upper eyelid: even this, he says, sometimes renders the infant quite pale. In the most robust children, he would not advise more than two leeches; one to each eyelid, or to the upper eyelid of each eye.] The child, in order to receive the full benefit of the solution of alum, should have its head laid flat between the knees of the operator, with the face uppermost: the lids should be separated from each other by the fingers, or, if necessary, as it almost always is, by the assistance of a blunt silver spatula, or some other blunt instrument, and the point of the syringe, loaded with the astringent lotion, should then be introduced between them and convey its contents all around: the syringing being repeated till the whole of the collected matter is washed away. The pain produced by the use of this solution is trifling, and the child ceases to cry almost as soon as the operation is over.

[In the early stage, Mr. Lawrence prefers a saturnine lotion made with rose-water. He also directs the bowels to be kept open with castor-oil or magnesia; and when the inflammation is active, and the tongue white, he lets the purgative medicine be preceded by a grain or two of calomel. He does not approve of blisters for young children.

The agglutination of the eyelids is to be prevented, and the exit of the discharge promoted, by frequently bathing them with tepid water, or milk, and applying a little lard, or fresh butter, to their edges.

* Lond. Med. Gaz. for 1833, p. 508. "All infants," says he, "are subject to the same change of residence, exposure to light, and to cold, &c., although only a small portion, it is presumed, are destined to pass, in their exit from the uterus, through a canal moistened with morbid secretions." The conviction of Mr. Middlemore is, that this disease is produced by the contact of morbid vaginal secretions.—Ed.

The inflammatory stage having been subdued, astringents are to be employed. Mr. Lawrence uses a solution of alum, in the proportion of from two to ten grains of alum to each ounce of water, according to circumstances. This lotion is to be carefully injected under the eyelids, three or four times a day, so as to cleanse out all the purulent secretion; and, in the intervals, a piece of rag, wetted with the same wash, may be laid over the eye. If the alum lotion ceases to have effect, a solution of nitrate of silver, in the proportion of two grains to each ounce of water, may be dropped into the eye two or three times a day.*]

If, when the inflammation begins to subside, an ulcer be detected on any part of the cornea, and especially if it be over the pupil, a solution of nitrate of silver, in the proportion of a grain to an ounce of water, should be dropped into the eye night and morning after the syringing is over, and the eye be kept open for about half a minute, so that the solution may not be wiped away suddenly by the closing of the lids, but may fairly lie upon the ulcer and float over it for this period of time. The sulphate of quinine should also be given, dissolved in a small quantity of water, to as great an extent as the infant can bear it [or the extract of bark, broken down and blended with milk, may be prescribed, as advised by Mr. Lawrence]; and if looseness be produced, it should be checked by a drop or half a drop of laudanum in each draught. Prussiate of potash is also a very good astringent for contracting the area of the ulcer, and expediting the healing process; and may be used instead of the solution of the nitrate of silver, in the form of an ointment, by means of the unguentum cetacei. By a careful perseverance in this process, I have not only seen ulcerations on the cornea heal speedily, but, in one or two instances, without leaving any cicatrix to impede vision, even where the ulceration has been seated over the pupil.

[The varieties of purulent ophthalmia said to arise from metastasis of gonorrhœa from the urethra to the eyes,† and from the inadvertent application of the urethral discharge to the eyelids, hardly require a particular description in a work of this nature.]

δ *Ophthalmia glutinosa*, so called in the present work, is the psor-ophthalmia of Plenck and Mr. Ware [the idiopathic inflammation of the glands of the eyelids, of Beer, and the catarrhal inflammation of the eyelids, of various modern writers]; and consists in an inflamed state of the small sebaceous glands, whose ducts, arranged in a row on the edge of each eyelid, pour forth a viscid matter that incrusts and hardens. [It appears to Mr. Lawrence, however, that the mucous membrane is the primary seat of the disease, and that the Meibomian glands, if diseased at all, are affected secondarily.—(*Lawrence on Dis. of the Eye*, p. 158.)] During sleep, when the lids have been for some time in contact, the matter glues them together so firmly, that they cannot be separated without many a painful effort. This matter, instead of being mild and lubricant, as in health, is now not only viscid, but acrimonious and erosive; whence the eye is irritated, and the edges of the lids ulcerated; and the complaint is apt to become chronic, and will sometimes last for years, or even for life, in which state it is termed lippitudo.

The disease is not unfrequently produced by smallpox and measles; occasionally by common ophthalmia from cold or any other causes, and in a few instances, though rarely, from a sty. Sometimes it appears to be the result of a scrofulous habit.

[In the acute stage, cupping or leeches, tepid lotions, mild ointments, and active aperients, are called for, followed up, if necessary, by a blister.] In the chronic stage, it is best attacked, and perhaps only to be cured, by such local stimulants as may excite a new action or inflammation, that may be more manageable. The practice of M. St. Yves was here very bold: he touched the ulcers on the edge of the eyelid with lapis infernalis, and thus cauterized the morbid surface. The unguentum hydrargyri nitratis, or the older form entitled unguentum hydrargyri nitrati, has of late been used with equal success, and with far less danger of injuring the ball of the eye. The best way of using it is to take up a little of it with a camel-hair pencil, and apply it along the edge of each eyelid.* Or a drop of spirits, as vinum opii, ether, or Riga balsam, may be allowed to fall into the eye in the same manner, and be repeated daily. [Besides local applications, the compound calomel pill, and other alterative and aperient medicines, are frequently necessary.]

SPECIES III.

OPHTHALMIA INTERNA.

INFLAMMATION OF THE INTERNAL PARTS OF THE EYE.

ACCOMPANIED WITH LESS EXTERNAL APPEARANCE OF DISEASE THAN THE PRECEDING SPE-

* The practice of using powerful stimulants in the early stage is strongly condemned by Mr. Middlemore. "Let the acute stage pass by; let the secretion become diminished; and the tense, florid state of the conjunctiva be exchanged for a comparatively pale, flabby appearance of that membrane, and then," he admits, "either the undiluted liq. acetatis, or the strong nitrate of silver ointment (ten grains to a drachm), may be advantageously employed."—See Middlemore's Lect. on Dis. of the Eye, as pub. in Med. Gaz. for 1833, p. 511.—ED.

† This particular cause, which is admitted by Richter, Scarpa, and Beer, is rejected by Mr. Lawrence, because "gonorrhœal ophthalmia may occur while the discharge from the urethra continues, and since it does not take place when that discharge is stopped."—On Dis. of the Eye, p. 229; see also his Treatise on the Venereal Dis. of the Eye.—ED.

* Other applications in common use are Janin's ointment, composed of Armenian bole and tutty, of each ʒij. white precipitate ʒj. and lard ʒss.; Singleton's, or the golden ointment, the active ingredient in which is orpiment, or the sulphuret of arsenic; and ointments containing the red precipitate in various proportions. Mr. Mackenzie puts from twelve to twenty grains of it to an ounce of lard.—See Practical Treatise on Dis. of the Eye p. 138.—ED.

CIES; ITS COMMENCEMENT AND PROGRESS FREQUENTLY INSIDIOUS; AND OFTEN ATTENDED BY LITTLE OR NO EXTERNAL REDNESS.

[INFLAMMATION may be confined to one of the internal structures, or all of them may be involved. The close connexion between the different internal parts and their common vascular supply, is sufficient to account for the extension of inflammation from one to another. If inflammation commences in the iris, it readily extends to the ciliary body, choroid coat, vitreous humour, and retina. On the other hand, it may spread forward to the anterior part of the eye, so that a case of iritis often involves in its progress the greater part or the whole of the internal tunics, and also the external parts. Inflammation, beginning in the retina, spreads in like manner to the vitreous tunic, choroid, iris, &c.—(*Lawrence*, op. cit., p. 268.) Mr. Lawrence treats of four varieties of internal ophthalmia; namely, inflammation of the anterior and posterior chambers of the eye; inflammation of the iris; inflammation of the internal tunics generally; and inflammation of the posterior tunics of the eye.

As this work is not designed to convey a minute account of ophthalmic surgery, the first variety must here be omitted, and our remarks confined to

α Iritis.	Inflammation of the iris.
β Inflammatio tunicarum internarum oculi.	Inflammation of the choroid coat and retina.

As in the arrangement of inflammation of the eye adopted in this edition, inflammation of the iris is classed as a variety of internal ophthalmia, and not as a species, no particular definition of it is placed as a leading head at the beginning of this section. Yet, as that inserted by Dr. Good is correct and instructive, it may be as well here to repeat it.]

Inflammation commencing in the iris; colour of the part changed to green or reddish; fibres less moveable, and shooting dentiform processes into the pupil; pupil irregularly contracted and grayish.

Dr. Schmidt, of Vienna, to whom we are chiefly indebted for an accurate description of this species, has denominated it *Iritis* (*Ueber Nachstaar und Iritis nach Staaroperationen*, Wien, 1801); and under this name it has of late years been described by many practical surgeons in our own country. The termination, however, is unclassical, and if the derivative be retained, it should unquestionably be iri*d*itis, instead of iritis; but ophthalmia *iridis* is better, as the disease is very clearly a species of a connective genus of diseases, rather than a distinct genus itself. It is the more singular, however, that iritis should ever have been used by its inventor, as the Germans have long employed the more correct relative compounds of iri*d*otomia iri*d*ectomia, and iri*d*odyalysis.

The exact change of colour which the inflamed iris assumes, first in its less, and then in its greater circle, depends upon the peculiar colour it possessed when in health. If this were grayish or blue, the morbid hue will be green; if brown or black, it will be reddish. The grayish or cloudy appearance of the pupil is produced by the secretion of coagulable lymph, which spreads over it in a fine flake like a cobweb. If the inflammation do not yield to the curative treatment, a yellowish-red tubercle forms in some part of the surface of the iris, commonly where the greater and less circles of the membrane meet; it enlarges, projects still forwarder, and is distinctly seen to be an abscess, which at length bursts and discharges its contents into the anterior chamber.

[Iritis is an adhesive inflammation; that is, an inflammation attended with deposition of new matter, indiscriminately called by the not very precise term of coagulable lymph. The chief character of the affection is this effusion of lymph, either into the texture of the iris, or in distinct masses on its surface, or in a more or less fluid form. This effusion of coagulable lymph, besides changing the colour and general appearance of the iris, impairs and destroys its motions; frequently renders it adherent to surrounding parts; alters the form and size of the pupil; and obstructs that aperture, so as to produce more or less impairment of sight. But, though the inflammation is called adhesive, and the substance effused is commonly lymph, it appears, pus may be poured out from the inflamed iris, or, at all events, a fluid of a yellowish colour, that sinks to the bottom of the anterior chamber, and cannot be distinguished from pus; and where the inflammation is violent, even blood itself may be effused.—(*Lawrence*, op. cit., p. 285.)

In the beginning, there is some intolerance of light; the sclerotic coat participates more or less in the inflammation; and there is consequently a greater or less degree of increased sensibility. If the inflammation be not relieved by proper treatment, Mr. Lawrence finds that an opposite state succeeds, or dimness of sight, caused by other changes which now take place in the pupil and cornea. From the commencement there is generally more or less pain, which varies in degree according to the acuteness of the attack, and often extends around the orbit, and sometimes to the front or back of the head. The pain is often characterized by nocturnal exacerbations.

In the enumeration of the symptoms of iritis, however, what most particularly deserves notice is the redness, which appears in the form of a zone around the cornea, and consists of the vessels on the forepart of the sclerotica. In the beginning, a pale pink blush of sclerotic redness is perceptible, and, although the conjunctiva is not altered, the trunks of the vessels of the sclerotica may be observed to be in a state of distention. If the affection continue to increase, the inflammation spreads from the iris to the corpus ciliare, choroid coat, and retina, with increase of pain and fever, and ultimately with irrecoverable loss of vision. At the same time, the mischief is propagated forward, the cornea becomes more opaque, the conjunctiva more inflamed, and great external redness is added to all the other symptoms.

After the active inflammation at length abates, the permanent disorganization and changes of structure remain; as general adhesion of the iris to the cornea, with opacity of the latter, and even staphyloma; or adhesion of the edge of the pupil to the capsule of the lens; a motionless contracted state of the pupil, &c.

A change of colour in the whole iris, with considerable contraction of the pupil, and an opaque substance in it, with intense external redness, great and deep-seated pain, and complete insensibility to light, are circumstances denoting, according to Mr. Lawrence's experience, a hopeless case. When the inflammation is recent, confined to the iris, and unattended with permanent changes of structure in the iris, cornea, or retina, or adhesions, and irregularity of the pupil, the prognosis is favourable.]

This distressing affection sometimes follows an operation for the cataract; in which an irritation is often excited, either by endeavouring to press out the lens through too small a wound in the cornea, by suffering some pieces of the lens to remain in the posterior chamber, or from too frequent an exposure of the internal surface to the air, by unnecessarily raising the flaps of the cornea. And the disease was hence, in our country, till of late, most absurdly denominated *secondary cataract*. [It also originates from accidental injuries, and irritation, and immoderate exertion of the eye.

Iritis is particularly apt to occur in certain states of the constitution, and, as Mr. Lawrence mentions, it has even been doubted whether there is any such thing as idiopathic iritis, except as the result of direct mechanical injury. The unhealthy condition of the constitution, promoting attacks of iritis, are those produced by morbid poisons, as in syphilis, or those occurring in individuals who are subject to gouty and rheumatic complaints. Iritis is rare in young subjects, in whom these states of the system do not exist.]

Where a patient is labouring under an arthritic diathesis, and is accidentally affected by a common ophthalmia, this species is apt to be ingrafted upon it. It is also an accompaniment of several cutaneous eruptions, especially those connected with an abuse of mercury.

The medical treatment should consist in free venesection, leeches, active purgatives, and low diet: blisters are then to be applied successively to the temples, behind the ears, and on the nape of the neck. [The body is to be kept perfectly at rest, as well as the organ; and the eye protected from all injurious external influences. According to Mr. Lawrence, local applications cannot be of much service in so serious an affection of parts comparatively internal. Tepid washes, he says, will perhaps be most soothing; but cold applications may be used if the patient prefer them.

The foregoing antiphlogistic measures will moderate the violence of the inflammation; but the effusion of lymph proceeds, and the above-mentioned alterations of structure are the result. For the stoppage of this destructive action, the free and prompt use of mercury is necessary, which not only stops the further deposition of lymph, but promotes the absorption of what is already effused. Two, three, or four grains of calomel, joined with one fourth or one half of a grain of opium, should be given every eight, six, or, in urgent cases, every four hours. When calomel disagrees, the blue-pill or mercurial frictions may be employed.]

Whether iritis be a primary affection, or connected with other diseases, even with syphilis, or induced by the action of mercurial preparations, Mr. Travers estimates mercury as almost a specific remedy.

[Belladonna is also to be used for preventing that contraction of the pupil, to which there is such a powerful tendency in iritis. If the inflammation be violent, Mr. Lawrence smears the moistened extract upon the eyebrow; when the organ is less irritable, he drops a solution of the extract between the eyelids. This part of the treatment is of the greatest importance, not only in preventing further contraction of the pupil, but because the influence of belladonna on the iris is so great, that, where adhesions have already taken place, if the effusion be very recent, the contraction of the iris will elongate the masses of effused lymph, stretch them out, and often completely liberate the margin of the pupil. The case, however, must be recent, and the belladonna assisted with the operation of mercury.]

Mr. Travers distinguishes also inflammation in the iris from that in the cornea, by regarding the latter as suppurative, and leading to an abscess, and the former as adhesive alone. And he tells us, that inflammation of the cornea so strictly maintains this character, that if it spread to the iris, and in this case become merely secondary it still preserves its adhesive power.

This species is also sometimes a concomitant of cutaneous eruptions, decidedly not syphilitic; and especially of those produced by a very extensive use of mercury; constituting what has been denominated by some writers *erythema mercuriale*, and hydrargyria, as we shall take occasion to notice under syphilis.

In the syphilitic or arthritic affection, however, a particular attention must be paid to the primary disease, since otherwise no local remedies can be of any avail.

Inflammation of the internal coats of the eye is a disease that has generally been overlooked by writers, and scarcely discriminated by practitioners. We have seen, that inflammation commencing in the iris, may extend to the internal coats of the organ, and even to the whole of the eyeball; but sometimes those coats become primarily inflamed.

The leading symptoms of the first stage are, a dull, deep-seated pain in the organ, aggravated by light, or exertion of the eye; impaired vision; with originally, and often throughout, but little external redness. The pain soon extends to the brow, occiput, and other parts of the head. The pupil may be either rather contracted, with a quick motion of the iris, or somewhat dilated, with sluggish motion of the latter part. The former, according to Mr.

Lawrence, is the earlier state, denoting excitement of the retina; the latter a later condition, indicating more advanced changes, attended with loss of sensibility in the nervous structure. The disorder is accompanied with febrile symptoms. As the disease proceeds, more sclerotic redness shows itself round the cornea; the iris changes colour and expands; and the sight becomes weaker and weaker, and is soon lost; after which misfortune the patient is troubled with various false luminous appearances.

In the second stage the iris closes, and projects in a convex form towards the cornea; and hypopium is produced by the effusion of matter in the anterior chamber. Complete amaurosis, suppuration, and collapse of the eyeball, and closure of the pupil, are the result of bad cases.

Greatly impaired vision, produced quickly, with pupil still clear, and not much contracted, Mr. Lawrence says, may be restored; but if sight should have been totally lost before the pupil has closed, or, if that opening be much contracted, and vision gone, there is no hope.

The treatment should be antiphlogistic, and followed up by the prompt and free use of mercury, combined with the local employment of belladonna. Bleeding and other antiphlogistic means may check the inflammation; but, unassisted by mercury, they are not adequate to prevent those changes in the retina which lead to blindness.

SPECIES IV.
OPHTHALMIA STAPHYLOMA.
PROTUBERANT EYE.

PROTUBERANCE AND PARTIAL OR COMPLETE OPACITY OF THE CORNEA; OR AN UNNATURAL PROTUBERANT STATE OF SOME PART OR PARTS OF THE SCLEROTIC COAT; SIGHT ABOLISHED OR IMPAIRED.

The term STAPHYLOMA is derived from σταφυλὴ, "uva," *a grape*, from the resemblance of the tumour of the cornea to the pulpy and semi-transparent appearance of this fruit. [The expression, *protuberant* eye, adopted by the author, is not precisely applicable, because the eye may be rendered protuberant by various other diseases.

The definition introduces us to the division into two species:—

α	Staphyloma corneæ.	Staphyloma of the cornea.
β	Staphyloma tunicæ scleroticæ.	Staphyloma of the sclerotic coat of the eye.

The term *staphyloma corneæ* is applied to a projecting and opaque state of this part of the eye. The whole of the cornea may be involved in the unnatural protuberance, or only a portion of it may be concerned. Hence, the varieties of *staphyloma totale*, and *staphyloma partiale*. In the first case, sight is in general completely lost; the cornea opaque; and the axis of the eye greatly lengthened; but, in the partial staphyloma, if it does not cover a large portion of the pupil, a considerable degree of *vision* may remain. When the disease embraces the whole pupil, or is accompanied with general opacity, sight is altogether destroyed. The protuberance of the eye interferes with the closure of the eyelids, by the friction of which against the forepart of the eyeball, and by the exposure of the organ to the atmospheric irritation, frequent attacks of pain and ophthalmia are excited, and even the other eye becomes weak and irritable.

Staphyloma of the cornea is mostly preceded by severe inflammation of the eye, particularly such as produces sloughing ulceration, and a consequently weakened state of the texture of the cornea, disposing it to yield to the distention of the contents of the eyeball. The case is likewise attended with an increased accumulation of the aqueous humour; to which circumstance, indeed, some writers mainly refer the origin of the disease. The irritation has often a sympathetic influence on the other eye, rendering it weak, irritable, and even inflamed.

The treatment is either palliative or radical. The palliative consists in the removal of the inflammation by antiphlogistic treatment, or by diminishing the volume of the swelling by puncturing the cornea with a cataract-needle, and letting out the aqueous humour. The repetition of this plan has even sometimes led to a radical cure; the protuberance permanently subsiding, and the eye becoming quiet. But, if the patient continue to suffer severely from frequent returns of inflammation, and especially if the other eye should be affected by sympathy, the radical treatment becomes indispensable. It consists in cutting away the staphylomatous protuberance with a common cataract-knife.

When the inner coats of the eye are the seat of considerable inflammation, it sometimes happens that the disorder so weakens and thins certain points of the sclerotic coat, that they afterward yield to the distention of the contents of the eyeball, and bulge or project in a greater or lesser degree, and the protuberance is either single, or more or less multiplied. The disease is particularly apt to occur in that part of the sclerotic coat which is near the ciliary body. The case is invariably accompanied with total loss of sight.

SPECIES V.
OPHTHALMIA ECTROPIUM.
EVERTED EYELID.

EYE WEAK AND WEEPING, WITH SLIGHT BUT CHRONIC INFLAMMATION; TARSUS THICKENED AND RETRACTED, WITH A PERMANENT REDNESS ON ITS VERGE.

This species is usually a relic or sequel of some form of ophthalmia, in consequence of ill treatment or neglect.* [The eversion may be either temporary or permanent. The former is common in the purulent ophthalmia of children, and other inflammations, in which the conjunc-

* Vetch, on Diseases of the Eye, 8vo., 1820. It may likewise accompany chemosis and also most stages of ophthalmia: our author's definition, therefore, is not unobjectionable.—Ed.

tiva is much swelled. The eyelid in these cases may be easily restored to its proper position again by the manual assistance of the surgeon, and, indeed, the part generally rectifies itself, as soon as the child ceases to cry.] Ectropium may be contemplated under two varieties: or, according to Scarpa, two species:—

α Lippitudo. Blear-eye.	The ciliary edge red, thickened, and highly irritable; the retraction simple; conjunctiva unexposed.
β Nudum. Naked ectropium.	The upper or lower tarsus completely everted, the conjunctiva exposed and turgid, with red vessels.

The bloodvessels visible in that part of the conjunctiva which covers the inside of the eyelids, are far more numerous than those observable in that part of it which covers the globe of the eye. And hence, in various species of ophthalmia, the interior of the eyelid is peculiarly apt to become turgid, and very highly inflamed; and, from turgescence, thickens at its edges, and is often so considerably everted as to expose a very large portion of the conjunctiva. And if these effects of inflammation be not duly attended to, both the thickening and eversion are apt to remain and become permanent; nor is this all, for the exquisitely tender membrane of the eyelid, constantly exposed to irritation from cold, sharp winds, dust, a strong light, and excoriating tears, increases in tenderness, is never free from some degree of inflammation, and at length becomes highly vascular, florid, fleshy, and carunculate (*ectropium sarcomatosum*), and exhibits a very hideous deformity; the everted eyelid sometimes becoming adherent to the cheek. [The frequent occurrence of ectropium in the lower eyelid as the result of lippitudo, is particularly noticed by Mr. Lawrence, who observes, that when the mucous membrane of the eyelid has been long inflamed and thickened, and when the irritating discharge has excoriated the skin, the latter shrinks under the repetition of such attacks, becomes shortened, and draws the margin of the eyelid outwards.]

In the commencement of the BLEAR-EYE, or vascular turgescence, the vessels should be scarified with a lancet; and it will be sometimes expedient to repeat the plan several times; for the operation itself produces a new and more healthy action, and gives a disposition to contractility. The edge and interior of the thickened tarsus should then be attacked with gentle stimulants and astringents; as a solution of alum, zinc, lead, or camphire; or applications of the best brandy, vinum opii, or the nitric oxyde of mercury, in the form of the college ointment. [The treatment recommended by Mr. Lawrence, consists in freely applying the red precipitate ointment to the thickened and everted conjunctival surface, as well as to the ciliary margin of the eyelid. It reduces the swelling of the conjunctiva, and rectifies the secretion of the tarsal glands. In this way, he says, ectropium may often be removed, even when accompanied with much thickening of the conjunctiva. If the latter affection do not yield readily, the part may be lightly touched with nitrate of silver. The shrinking thus produced on the internal surface of the conjunctiva, draws the edge of the eyelid into its natural situation. When the case is more obstinate, and resists the foregoing plans, the excision of the surface of the thickened membrane is to be performed, after which, in proportion as the wound heals, the eyelid is drawn into its right position again.]

The SECOND VARIETY, OR EVERTED EYELID, when of long standing, is accompanied with a hard or horny cicatrix [and frequently with such a change in the figure of the tarsus, in consequence of its having been long in a stretched state, that, even if the eyelid were replaced, it would not properly adapt itself to the convexity of the globe]. In such cases, the only cure seems to be that recommended by Sir William Adams, of cutting out, with a pair of scissors, a strip of the tarsus in the form of the letter V; afterward separating the eyelid from the cheek whenever it adheres to it; and, finally, supporting the lid, now raised into its proper place, and confining the edges of the cut eyelid, brought into a state of juxtaposition, by a proper bandage.—(*Pract. Obs. on Ectropium*, &c., chap. i.) The divided edges heal by the first intention; and the cure is often completed in a fortnight, with a restoration of the eyelid to its healthy form.

Sir W. Adams recommended the same process for the simpler and earlier stages of everted eyelid, or where there is no hard or horny cicatrix, but a morbid turgescence of the internal membrane of the eyelid, often accompanied with granulations; yet, as Mr. Guthrie has given ample evidence, after Beer (*Lehre von den Augenkrankheiten*, band ii., p. 144, Wien, 1817), in both these cases, a skilful application of a very small portion of sulphuric acid to the internal conjunctiva, upon the end of a probe, will of itself suffice to effect a cure, will destroy the minute caruncles, and produce almost any degree of contraction throughout the extent of the eyelid, even to that of an inversion of the ciliary edge, if carried too far (*Operative Surg. of the Eye*, &c., p. 56, 8vo., Lond., 1823), the operation just noticed should, perhaps, always be reserved for the examples above specified.

SPECIES VI.
OPHTHALMIA ENTROPIUM.
INVERTED EYELID.

TARSUS DRAWN INWARD; CILIARY HAIRS BENT AGAINST THE CONJUNCTIVA; AND PERMANENTLY IRRITATING AND INFLAMING THE EYE.

THIS disease is sometimes known by the name of trichiasis. The evil it produces is the reverse of that just described, and consists in an internal traction of the tarsus above or below, in consequence of which a perpetual irritation is produced in the conjunctiva, by the friction of the hairs of the eyelid, thus thrown

out of their natural line of growth. The inflammation is in time communicated to the cornea, which becomes opaque, and is frequently ulcerated. When the disease has acquired a chronic state, the integuments appear redder than usual, the eyelid is thickened, the conjunctiva is contracted at its commissures, and the tarsus assumes an unnatural curvature.

[Entropium may be either temporary or permanent; partial or complete. According to Mr. Lawrence's interesting description, temporary inversion, particularly that of the lower eyelid, is apt to occur in chronic external ophthalmia, and sometimes even in acute cases. Permanent ectropium may happen from two causes: there is frequently, in elderly persons, a relaxation of the integuments; the skin of the eyelid loses its elasticity; falls into wrinkles; the fat is absorbed from the surrounding parts; and thus loose folds are formed in it. The balance between the external surface and the mucous lining of the eyelid is lost, and inversion is the consequence. In another form of the disease, the cause is seated in the tarsus and mucous lining of the eyelid; these parts being corrugated and shortened in consequence of repeated chronic ophthalmiæ. The temporary ectropium may generally be remedied by putting a small compress against the lower portion of the eyelid, and retaining it there for twelve or twenty-four hours, by a strip or two of sticking-plaster, after which time the disease will not return.]

Various plans have been devised for the cure of the permanent form of the defect from the time of Celsus, or rather of Hippocrates. Of these the chief have consisted in a careful attention to remove, and, if possible, prevent the future growth of hairs, either by pulling them out, or destroying their roots with sulphuric acid; a removal of a fold of the skin, and producing an artificial retraction by drawing the extremities of the wound together by sutures or strips of adhesive plaster, as recommended by Scarpa; the plan of destroying a similar portion of skin with caustic, or concentrated sulphuric acid; and, lastly, an entire removal of the edge of the eyelid, including the cilia, as proposed by Jæger, and since performed with little variation by Mr. Saunders.

Of these methods, the first, which is the simplest, rarely, if ever, as Beer has justly observed, produces a permanent cure; [the second and third answer very well in ordinary cases; but the fourth is peculiarly unsightly in the issue.

When the tarsus is permanently shortened and corrugated, common methods sometimes fail, in which event either Mr. Crampton's plan may be followed, or the modification of it adopted by Mr. Guthrie.] Its principle consists in taking off all contraction, by slitting up the eyelid at each angle, and then producing a sufficient degree of permanent retraction, by taking away a small slip of the affected tarsus as near the edge as may be, and afterward uniting the margins of the wound, as already noticed, by small sutures, the threads of which are to be fastened with sticking-plaster to the eyebrow, so as to keep the edge of the eyelid duly everted, till the sutures are removed.*

GENUS IX.
CATARRHUS.
CATARRH.

INFLAMMATION OF THE MUCOUS MEMBRANE OF THE FAUCES, OFTEN EXTENDING TO THE BRONCHIA, AND FRONTAL SINUSES; INFARCTION OF THE NOSTRILS; SNEEZING; AND, FOR THE MOST PART, A MUCOUS EXPECTORATION, OR DISCHARGE FROM THE NOSE.

CATARRH is a Greek compound, and imports "defluxion;" from κατὰ, denoting, as stated in the table of significations to the affixes and suffixes of medical terms in the Nosology, "augmented action," and ῥέω, "to flow." Catarrhus, however, like ophthalmia, has been used in various senses and latitudes by different authors. The old pathologists distinguished between three separate terms, which are now regarded by many writers as synonymous:

"Si fluit ad pectus, dicatur rheuma CATARRHUS;
Ad fauces, BRONCHUS; ad nares, esto CORYZA."

This couplet is, perhaps, founded upon Galen's account of these affections.

Sauvages has only deviated from the rule contained in the above Latin couplet, by omitting bronchus and employing catarrhus in its stead, and rheuma in the stead of catarrhus; so that with him RHEUMA imports a cold, or febrile defluxion of the chest; CATARRHUS, the same affection of the fauces, and adjoining organs; and CORYZA, the same malady of the head or nostrils.

Cullen has regarded rheuma, coryza, bronchus, and catarrhus as synonymous terms, scarcely indicating varieties of the same disease. The arrangement of Dr. Cullen, moreover, did not allow him to place box, tussis, or cough, anywhere else; and, being obliged to yield to the force of necessity, he has made cough also a synonyme of catarrh, and has treated of it under this genus. It is here the present system differs from Dr. Cullen, as it does likewise in separating coryza from the list of phlogotic affections. Cough is not necessarily a pyrectic or inflammatory disease, though it may be occasionally a symptom of such disease. Cough, therefore, under the Greek term BEX, we have already considered, as well as CORYZA, under the second or PNEUMATIC class; where they will probably be allowed by most nosologists to occupy more correct and natural posts, than in the present place. Catarrh, thus explained, embraces the two following species:—

1. Communis. Cold in the Head or Chest.
2. Epidemicus. Influenza.

Under neither of these species can catarrh be regarded as a dangerous or very serious dis-

* Operative Surgery of the Eye, &c., p. 33. 8vo., Lond., 1823. Quadri, Annotazione pratiche sulle Malattiè degli Occhi, Napoli, 1819. Travers, Synopsis of the Diseases of the Eye, 1813 Beer, Lehre, &c., ut suprà.

order, unless neglected or treated improperly; or it occur with great severity in persons of delicate lungs, or possessing a consumptive diathesis; in all which cases its result may be very mischievous, and lead on either to pneumonitis, bronchlemmitis, phthisis, or dropsy of the chest, though in itself, and separate from such concomitants, by no means alarming.

SPECIES I.
CATARRHUS COMMUNIS.
COLD IN THE HEAD OR CHEST.

FEVER SLIGHT; MUCOUS DISCHARGE CONSIDERABLE.

THIS is the *pose* of old English writers, a term precisely synonymous with the *gravado* of Celsus, which is also employed in the earlier medical works of our own country. To *pose* is still used in the sense of to stupify, and the real meaning of posy is a "narcotic charm," and hence a nosegay of tranquillizing odour inducing repose or sleep. The common symptoms of this species are a sense of fulness in the head, and of weight over the eyes, which are inflamed and lachrymose. The nostrils are obstructed, and pour forth a thick acrimonious ichor, which excoriates the skin as it descends, accompanied with frequent sneezing. The voice is hoarse, the fauces sore, and the lungs loaded, often producing a troublesome cough.

Its usual cause is suppressed perspiration from cold; whence Dr. Cullen conceives, that cold is the constant and only cause, and would in every case be detected to be such, were men acquainted with, and attentive to, the circumstances which determine cold to act upon the body.

From the similarity between the fluid exhaled from the skin and that from the lungs, he conceives that, whenever the former secretion is obstructed in its flow, it is transferred to, and passes off with the latter; the cough being produced by the stimulus of the increased action, and exhalation.

There seems, however, to be, in many cases at least, something more than this; for neither cold nor suppressed perspiration will account for every instance of common catarrh. There are few practitioners, perhaps, but have sometimes known persons thus affected who have been bedridden from chronic lameness or some other cause, and have had their chamber warmed night and day by a fire. Some ladies always catch a cold in the head on quitting the town for the country; and others on quitting the country for the town. Something must therefore depend on the actual state of the constitution at the moment; and something upon the variable quality of the atmosphere; and a change in both frequently perhaps concurs in producing the affection of a common catarrh.

Where the attack is slight, medical aid is not often sought for or needed. A few days of domestic repose in a warm but not a close atmosphere, diluent drinks, with an abstinence from animal food, and vinous or other fermented liquors, a sudorific posset at night, with an additional blanket thrown over the bed to encourage perspiration, usually succeed in carrying off the complaint. But if there be a sense of oppression on the chest, or of fulness in the head, with the ordinary signs of fever, constituting what is often called pulmonary catarrh, the bronchitis of Dr. Badham, venesection should be had recourse to, and a smart purgative immediately afterward, while the preceding process is still continued. If the cough should be troublesome at night, it will be best allayed by a dose of Dover's powder, which will take off the irritation, and determine to the surface.*

Catarrh is also found, occasionally, as a symptom in measles, smallpox, worms, dentition, and rheumatism.

SPECIES II.
CATARRHUS EPIDEMICUS.
INFLUENZA.

THE ATTACK SUDDEN; GREAT HEAVINESS OVER THE EYES; FEVER STRIKINGLY DEPRESSIVE; EPIDEMIC.

THIS species differs chiefly from the preceding in the abruptness of its incursion, the severity of its symptoms, and very generally in the rapidity of its transition. It probably also differs in the nature of its remote cause.

It commences, according to Dr. J. C. Smith, who has accurately given us its progress as it appeared in 1781 and 1782, with the usual catarrhal symptoms, in conjunction with others that are far more distressing to the patient, and often not less alarming to the physician; such as great languor, lowness and oppression at the præcordia, anxiety, with frequent sighing, sickness, and violent headache. The pulse is peculiarly quick and irregular, and at night there is often delirium. The heat of the body is seldom considerable, particularly when compared with the violence of the other symptoms; the skin is moist, with a tendency to profuse sweating; the tongue moist, but white or yellowish. Sometimes there are severe muscular pains, general or local; at other times, erysipelatous patches or efflorescences on different parts of the body, which, in a few rare instances, have terminated in gangrene and death. From the onset, for the first twenty-four or forty-eight hours, the symptoms are extremely violent, far beyond the danger or duration of the distemper. For the most part, it attacks the healthy and robust; children and old people either escape entirely, or are affected in a slighter manner.†

* Dr. Corrigan believes that there are two species of catarrh; one not extending its effects to the bronchia, and curable by camphire mixture and opium in twenty-four hours; the other affecting the bronchial tubes, and demanding the same treatment as bronchitis.—See Dublin Journ. of Med. and Chymical Science, No. i.—ED.

† In the influenza of particular years, the mortality has been chiefly in children and aged individuals. The last visitation of this disorder in London proved fatal to a great number of old persons.—ED.

Pregnant women, however, are disposed to miscarry, and the flooding is in some cases fatal. Patients, also, subject to pulmonic complaints, suffer much from the cough, difficulty of breathing, and other peripneumonic symptoms, which occasionally lead on to dissolution.—(*Med. Communications*, vol. i., p. 71.)

Such is the general progress of influenza in most of the periods in which it has shown itself. But, in every period, its symptoms have considerably varied in severity in different individuals. In many instances, they have scarcely exceeded the signs of a common cold; in others, the pleuritic pain has been very acute, or the headache intolerable, shooting up to the vertex with a sense of splitting; the pulse has been a hundred and forty, and often considerably more, in a minute, with incoherency or delirium from the first night. Yet cases of real danger are very few; and the violence of the disease is over frequently in forty-eight hours; sometimes in twenty-four. Those who have suffered appear to be insusceptible of a second attack during the continuance of the epidemy, though they have no indemnity against the next that may appear. In many cases, however, the general debility, induced on the system, does not terminate with the catarrh itself, but remains for weeks, perhaps for months, afterward, and is sometimes removed with great difficulty.

The disease has been known and described from the time of Hippocrates* to the present day: and is dwelt upon at great length by Sydenham, who regarded it in the autumn of 1675 as a general cough, produced by cold and moist weather, grafted upon the autumnal epidemy, and varying its symptoms; whence the fever, which had hitherto chiefly attacked the head or the bowels, now transferred its violence to the thorax, and excited symptoms which had often a semblance to those of genuine pleuritis, but in reality were not so, and demanded a different and less evacuant treatment, the patient being uniformly made worse by copious and repeated bleedings; though a single moderate venesection was often useful, and, in a few instances, a second: beyond which Sydenham always found it mischievous to proceed. And in proof that this was the real nature of the case, he observes, that "these catarrhs and coughs continued to the end of November, after which they abated, but the fever still remained the same as it was before the catarrhs appeared;" meaning that it then returned to its essential character: "although," he continues, "it was neither quite so epidemic, nor accompanied with quite the same symptoms; *since these incidentally* depended upon the catarrhs."

Influenza, however, as we shall have occasion to show presently, has not only occurred in the autumn, but in every season of the year, whether hot, cold, damp, or temperate; and when there has been apparently no other constitutional distemper with which it could unite itself. The chief returns of the disease which have been remarked in this country since the above of Sydenham, are those of 1732, 1762, 1775, 1782, 1803, and 1831: the duration of the epidemy was in every instance from a month to six weeks. That the disease is an epidemy, cannot be doubted for a moment: yet this is to advance but a very little way towards a knowledge of its origin or remote cause; for we have still to inquire into the nature of epidemies, their sources, diversities, and means of diffusion; often, as in the case of spasmodic cholera, in the very teeth of periodical winds and other meteorological phenomena that we might fairly conclude, if we did not know the contrary, would irresistibly oppose their progress, or disintegrate their principles, and consequently abolish their power.* Dr. Sydenham, with the modesty which peculiarly belongs to himself, and always characterizes real knowledge, freely confesses his ignorance upon the subject, though he is rather disposed to ascribe them to "some occult and inexplicable changes wrought in the bowels of the earth itself, by which the atmosphere becomes contaminated with certain effluvia, which predispose the bodies of men to some form or other of disease;" while Hippocrates, who had pursued the same recondite subject with an equally indefatigable spirit upwards of two thousand years before, resolves them, with a devotional feeling which would do honour to the philosophy of the present day, but which the philosophy of the present day has not always evinced, into a present divinity, a providential interposition; for such, as Galen informs us, is the actual meaning of his TO ΘEION (*De Prognos.*, lib. i.), and not some unknown and latent physical principle of the atmosphere, as various expositors have conceived:—"non enim quæcunque causas habent incognitas et abditas DIVINA vocamus; sed ubi admirabilia videntur duntaxat."—(*Comment. in Progn. Hipp.*)

An epidemy, however, or state of the atmosphere capable of producing any general disorder, whether originating specially or in the ordinary course of nature, may depend upon an intemperament, or inharmonious combination of the elementary principles of which it consists, or upon some foreign principle accidentally combined with it, and which has of late years more

* This statement is at variance with other accounts of the subject: thus, in the Cyclop. of Pract. Med., it is alleged, that we find no medical description of the epidemic catarrhal fever before the year 1510. "It was called coccoluche, because the sick wore a cap close over their heads." Schenck observes, that physicians then looked upon it as a new disease. Its course seems to have been in a N. W. direction from Malta to Sicily, Spain, Italy, Germany, France, and Britain; and Short says, that "it attacked *at once*, and raged over all Europe, not missing a family, and scarce a person, and that none died except some children. In some it went off with a looseness; in others, by sweating."—(See Short's Chronol. Hist. of the Weather, &c., vol. i., p. 204; and Dict. des Sc. Méd., art GRIPPE.) Tozzetti's Cronica Meteorologica Toscana, a work referred to by Cullen in relation to influenza, was published, however, in 1823.—ED.

* Like cholera, the influenza has also generally extended itself from the east towards the west, and from the south towards the north; which is a curious coincidence.—ED.

especially been called a miasm or contamination. It is possible, that both these may be causes of different diseases; and, in this case, the term epidemy might be more correctly limited to those which issue from the first cause than from the second: and Dr. Hosack has endeavoured thus to limit it. But as it is rarely that we can distinguish between the two, and especially as the term has been very generally applied to diseases arising from both sources, it is not worth while to alter its common signification.

In the disease before us, many writers have endeavoured to trace it to the first of the above causes, and particularly to the atmosphere's being in a state of negative electricity; and Weber, fully confiding in this cause, has recommended, somewhat whimsically, the use of socks made of the most powerful non-conductors, as oiled silk, or paper covered with sealing-wax, as a certain prophylactic.—(*Rahn, Briefweech. mit seinen ehemaligen Schülern*, band. ii., Zürich, 8vo., 1787.) Others, without undertaking to determine in what the atmospheric intemperament consists, have regarded it as a mere exciting cause of catarrhs, or, in other words, as merely rendering the body more susceptive of the ordinary causes of this disease, and hence converting a sporadic into a general distemper.

More commonly, however, catarrh, as well as other epidemics, has in modern times been contemplated as dependant upon the second of the aërial causes just adverted to, namely, the existence of a specific miasm, or morbid principle of a peculiar kind, in the atmosphere, distinct from any change in the combination of its proper elements;* and hence, Professor Frank (Op. cit., p. 118–19), after adverting to the "in ambiente nos aëre mutatio," adds, "non sine magnâ latentis contagii suspicione." There is much, indeed, to support this opinion; for in many cases, as in intermittent and remittent fevers, we can manifestly trace such an origin; and, as we have already shown that contagions and miasms are often identic or nearly so, the former may be brought forward as abundantly confirming the same view.

This identity, or approach to identity, between contagions and miasms, is closely connected with the present subject, and must be a little examined into for its clear elucidation.

In treating of the origin and laws of febrile miasm we observed, that it is of two distinct modifications, or proceeds from two distinct sources; that, in its ordinary course, it first appears as the result of a decomposition of dead organized matter, operated upon by the common auxiliaries of putrefaction; but that afterward, "during the action of the fever thus produced, the effluvium from the living body is loaded with miasm of the same kind, completely elaborated as it passes off, and standing in no need of the decomposition of the effluvium for its formation; under which form it is commonly known by the name of contagion."

I may now add, that, as primary febrile miasm is not the only miasm generated in the atmosphere, so it does not seem to be the only miasm that gives rise to contagion: that both are very numerous in their kinds, and that specific contagions are, though perhaps not always, yet far most generally, a result of specific miasm produced as above. This seems especially to be the case in respect to influenza; for though most individuals labouring under it are evidently affected from an atmospheric taint, many, as we shall show presently, appear, as in the case of remittent or typhus fever, to receive it from personal contagion: nor is there, in fact, any reason why a puriform discharge from the mucous membrane of the nostrils may not be contagious, as well as a puriform discharge from the mucous membrane of the eyelids in ophthalmia, or from the urethra in blenorrhœa, or, as we shall shortly have to notice, from the rectum in dysentery. Among dogs and horses we perceive the same disease, in many instances highly and extensively contagious, and accompanied with so violent a degree of fever as to be peculiarly dangerous, especially to the young of these kinds. In South America, in particular, this affection is so violent, that half the dogs pupped there are supposed to die of it while sucklings. Whence, in common language, it is called emphatically *the distemper*, though vulgarly, the *snaffles*, or rather *snuffles*, from the state of the nostrils. In nosology, it is commonly called *catarrhus caninus*.

Generally speaking, specific miasms and contagions, capable of affecting one kind of animals, are incapable of affecting any other kind; or, at least, rarely extend their influence any farther. In a few febrile pestilences, quadrupeds and birds seem to have been fellow-sufferers with mankind, as we have already had occasion to notice under EPANETUS MALIGNUS, or malignant remittent fever. But this is not common; and, in some instances, is well known to have depended upon the general dearth of a country, or the insalubrity of the preceding harvest. A few of the exanthems, as cowpox, are capable of propagation from one species to another; but the greater number of them are not, or only with great difficulty. When a putrid fever has broken out among a ship's crew, the live stock has never been known to suffer from it: and it has happened occasionally, when large numbers of sheep and hogs have been stowed in a ship for the purpose of exportation, sometimes the former have been attacked with infectious fever, and sometimes the latter; but the sheep have never communicated it to the hogs, nor the hogs to the sheep, nor either of them to the ship's crew. "It seems to be a general law of nature," observes Sir Gilbert Blane, "at least among the mammalia, that accumulation and stagnation of the exhalations of the living body produce disease. The glanders of horses arise only in large stables, and the distemper of dogs in kennels. During the American war, it was proposed to send live sheep from England across the Atlan-

* See especially De Mertens, Observ. Med., tom. ii., p. 4; and Simmons, Lond. Med. Journal, 1788, part iv.

tic. In a few weeks, in consequence of being crowded in a ship, they all died of a febrile disorder."—"In the expedition to Quiberon in 1795, several horse-transports had their hatches shut for a length of time in a storm, by which means eight horses were suffocated. Those which survived became affected with the glanders soon after they landed. Professor Colman saw twenty of them under this disorder; a considerable number had been previously destroyed."—(*Med.-Chirurg. Trans.*, vol. iv., p. 89, 475.) It does not appear, that, in either of these instances, the respective disorders were communicated from one genus or species of animals to another.

That the catarrh before us possesses not only an epidemic character, but is dependant on atmospheric influence, is established by so many well-known proofs, that it is hardly worth while to give examples. Of a dozen persons in perfect health in the same room, ten have often been attacked as nearly as possible at the same time. In the influenza of 1782, three families, consisting of seventeen persons, arrived on the same day at a hotel in the Adelphi, all in perfect health. The next day they were all affected with the symptoms of the reigning disease.—(*Med. Trans.*, vol. iii., p. 59.) In an hospital containing a hundred and seventy persons, more than a hundred were on one occasion attacked within twenty-four hours; and few of the remainder escaped afterward.

We have said, however, that the middle-aged, the strong, and the robust, are affected soonest, and suffer most severely, while the young and the old are less susceptive of its influence. In proof of this we may advert to the fact, that healthy and well-disciplined soldiers suffer peculiarly. In 1782, this was especially the case at Aberdeen: at Dublin, there were, at the same period, seven hundred soldiers confined under it in their barracks at once, and incapable of doing their duty (*Dr. Hamilton, Mem. Med. Soc. of Lond.*, 1782); while at Utrecht, the number amounted to not less than three thousand. On the contrary, out of seven hundred boys in Christ's Hospital, during the same epidemy, only fourteen had the disease, and all of them in the slightest manner.*

The proofs of communication by personal contagion are not less decisive. "The first," says Dr. Hamilton, describing the influenza of 1782, "who were seized with it at Norwich were two men lately arrived from London, where it then continued to rage. A sergeant of grenadiers in the 10th regiment of foot went to London on furlough: the disease then raged in the capital. He returned in a few days to St. Albans, affected, and communicated it to the people in whose house he had his billet. This was the first of its appearance there, and from thence it spread rapidly all over the town."†

Dr. Cullen in his Synopsis has followed the more striking returns of influenza, from the fourteenth century down to the present times; or rather from the Cronica Meteorologica Toscana of 1323, by *Targioni Tozzetti*, to *Saillant's* Tableau des Epidémies Catarrhales. "In all these instances," says he, "the phenomena have been much the same: and the disease has always been particularly remarkable in this, that it has been the most widely and generally spreading epidemic known. It has seldom appeared in any one country of Europe, without appearing successively in every other part of it." And, in some instances, the infection has passed the Atlantic with little or no remission of its severity, and attacked Americans who had not had the slightest intercourse with Europeans.

And hence we are capable of tracing it at sea as well as on land. In the epidemy of 1782, Lord Howe sailed in the month of May with a fleet for the Dutch coast; and Admiral Kempenfelt for that of France. The crews of both fleets were well on sailing: but, in the same month, both were attacked very generally, and the latter was obliged to return home. The previous state of the air, with respect to any of the sensible qualities of heat, cold, electricity, or damp, seems to have exercised but little power. Influenzas, as already observed, have recurred at every different season, in every state of the barometer, thermometer, and hydrometer.

Thus the influenza of 1762, one of the severest on record, producing effects which continued, in many instances, for two or three years afterward, was preceded by weather uncommonly warm; while in that of 1767, being the next in rotation, which was also very severe, though productive of less durable mischief to the constitution, the weather was remarkable for being unusually cold.—(*Dr. Heberden, Med. Transact.*, i., art. xviii.) We know nothing of the country from which the disease has at any time taken its rise; but it has frequently seemed to proceed from north to south, though it has occasionally travelled from west to east. That of 1781 and 1782 is said to have originated in China, and to have travelled through Asia into Europe; whence it crossed the Atlantic, and arrived the ensuing year in America. But this assertion wants confirmation. If we allow its materies to depend upon specific miasm floating in the atmosphere, we can only account for its preserving its agency so long, and operating in such distant theatres, by supposing that its particles are with great difficulty dissolved or decomposed in the air, even when in its purest state or highest degree of agitation by tempest. Of the specific miasms we are a little acquainted with, some seem to dissolve or lose their power

* Med. Trans., vol. iii., p. 56. It has been already noticed, that when the influenza visited this country in the spring of 1833, old persons suffered with peculiar severity, so that many of them were cut off.—Ed.

† *Mem.* Med. Soc. of Lond., *ut supra*. The opinion on this point, delivered by the author of the art. Influenza in the Cyclop. of Pract. Med., is, that the disorder generally arises from, and is propagated by, some general cause, subsisting in the atmosphere; "but that it is probable a limited propagation also takes place, by personal intercourse, *under the influence, and during the prevalence, of the epidemic constitution.*"—Ed.

much more readily than others, and hence spread their influence through very confined peripheries; while others are only dissoluble in a pure atmosphere, and consequently retain all their virulence in an air already saturated with other foreign elements.

The chief influenzas that have visited Europe within the last three centuries, occurred in the following order of time:—1510; 1557; 1580; 1587; 1591; 1675; 1709; 1732–3; 1743; 1762; 1767; 1775; 1781 and 1782; since which period, the return of the disease has been little noticed in respect to extent or violence.*

The remedial treatment needs not detain us long, notwithstanding the violence with which the disease makes its assault. Bleeding, as we have already observed, is rarely required, and, from the debility so soon induced, should be avoided, except in urgent pleuritic pains, which are not common. It was tried copiously by many practitioners in 1782, but they soon reverted to the cautionary track of Sydenham. Quiet, diluent drinks, and the promotion of that easy breathing perspiration which Chenot has distinguished by the name of diapnöe, will usually be found sufficient, if the bowels be kept free from confinement.† If the chest be much loaded, an emetic will afford the best relief. And, if the cough be troublesome, and the breathing laborious, both which, however, are generally alleviated by an emetic, small doses of ipecacuanha, with or without oxymel of squills, will promote an easy expectoration, and take off the sense of oppression. Dr. Cullen joined these with opium, and was particularly attached to the use of Dover's powder in all catarrhal affections, asserting that there is no disease in which opium has been found more useful.‡ But it generally agrees better in common catarrhs than in influenza. The subsequent debility may be removed by a free use of the bark, gentle exercise, pure air, cold bathing, and a liberal regimen; which last, indeed, should be continued through the disease itself. The cough occasionally produced remains sometimes as a sequel, long after the other symptoms have disappeared: and, in this case, opium with camphire, or the resinous balsams, or the extract of hemlock, or of hyoscyamus, prepared in a steam-heat, often affords essential relief, and especially at night; yet it has not been found that even the symptom of a cough has proved any impediment to the use of the bark, or even that of cold bathing, or been augmented by the practice, as influenza has rarely terminated in phthisis, and, according to Dr. Carmichael Smith, is less disposed to produce this complaint than a common catarrh.*

* The influenza of 1831, which occurred subsequently to the author's decease, was generally mild in its character, though almost universal; for it seems to have appeared in both hemispheres, in India as well as the United States of America. About a month before the epidemic cholera broke out in Warsaw it prevailed in that city, and in the spring and autumn it also swept over great part of England, Scotland, and Ireland. Late in the autumn it attacked Paris, the south of Spain, Gibraltar, and Italy, with more severity than the British Islands.—See art. INFLUENZA, in Cyclop. of Pract. Med.—ED.

† Strong purgatives are generally objected to in cases of influenza, on account of the tendency to a morbid state of the mucous coat of the bowels, usually accompanying the complaint.—ED.

‡ Mat. Med., part ii., ch. vi. At the commencement of the disease opiates are frequently found hurtful, increasing the febrile heat, aggravating the headache, and stopping the expectoration; but in the decline of the complaint, they may be more advantageously given. Our author has not noticed blisters, which often afford great relief. A solution of gum ammoniac, with oxym. of squills, is in these cases a valuable medicine.—ED.

GENUS X.

DYSENTERIA.

DYSENTERY. BLOODY FLUX.

INFLAMMATION OF THE MUCOUS MEMBRANE OF THE LARGER INTESTINES; GRIPING AND TENESMUS; FREQUENT AND OFTEN BLOODY DEJECTIONS; THE FECES IRREGULARLY DISCHARGED.

DYSENTERY is far more frequent in the autumnal months than in any other season of the year. The animal frame is at this time generally relaxed and debilitated by a long exposure to the stimulus of a high atmospherical temperature, and, in many cases, to that of the direct rays of the sun. The digestive organs and intestinal canal necessarily partake of this debility, and are more easily irritated and thrown out of the order of health, than at any other time. Hence diarrhœas and colics, and that hepatic flux which by some writers has been regarded, but erroneously, as a variety of dysentery. And hence, also, proper dysentery; which, in a particular state of the intestinal canal, is excited, rather than any of the rest, by causes that are perhaps common to the whole.

These causes may be DIRECT OR SYMPATHETIC: and, as most of these are peculiarly incidental to hot climates, we may readily perceive why dysentery should be more prevalent in them than in other situations.

The DIRECT CAUSES are chiefly those of diet; and may consist of any sudden application of cold to the stomach very much below its actual temperature, as drinking cold water or eating con-

* The reader will find much information in regard to the epidemic catarrhs and other diseases which have prevailed extensively in the United States, contained in Webster's Hist. of Pest. Diseases, Mitchell and Miller's N. York Med. Repository, Coxe's Phil. Med. Museum, Chapman on Epidemics, in the Phil. Journ. of Med. Sc., Yandell's Transylvania Journ. of Medicine and the Associate Sciences, Hosack and Francis's Am. Med. and Phil. Register, the New-England Journal of Medicine and Surgery, Barton's Med. and Phys. Journal, the Am. Journ. of Med. Sc., the works of Dr. Rush, Williams's History of Vermont, Belknap's History of New-Hampshire, Chalmers on the Weather and Diseases of South Carolina, Ramsay's History of South Carolina, Gallup on the Epidemics of Vermont, the Collections of the Mass. Historical Society, &c. &c.—D

fectionary ices when in a state of considerable heat; eating flatulent herbs, unripe or sub-acid fruits, and especially to excess; or food of little nourishment and difficult of digestion; drinking impure water, and especially when impregnated with the decomposing elements of animal or vegetable substances. In this last case, as well as in one or two of the preceding, the disease is often endemic, and extends to almost every one who is under the influence of such a cause; of which a striking example occurred, not many years ago, among the soldiers stationed in the old barracks at Cork. While the disease was raging with great violence, it was observed by Mr. Bell, the temporary surgeon, that the troops were supplied with water contaminated by an influx from the public sewers, and rendered brackish by an intermixture with the tide. He instantly changed the beverage, and had the barracks supplied by water-casks from a spring called the Lady's Well, when the disease almost immediately ceased.—(*Dr. Cheyne in Dublin Hospital Reports*, &c., vol. iii., p. 11.)

We meet with various examples of a like kind. Thus Rolander, while residing with Linnæus, was repeatedly attacked with this affection, which he ascribed to drinking stagnant water contained in a cistern of juniper-wood. In this cistern was discovered a species of acarus, which Linnæus, who was fond of resolving almost all diseases into an animalcular origin, immediately regarded as the source of the complaint, and specifically distinguished by the name of acarus *dysenteriæ*.—(*Amæn. Acad.*, vol. v., p. 82, et alibi.)

The SYMPATHETIC CAUSES are those which operate on the intestines through the medium of other organs, chiefly of the skin or the lungs; as exposure to currents of cold air when the body is heated; wet clothes and wet feet, producing, like the last, a sudden suppression of perspiration. And hence a damp marshy soil, or sudden changes in the atmosphere from hot and dry to cold and moist. And as in the autumnal months we find the bowels apt to be directly affected by water contaminated with peculiar impurities, we have reason to believe that they are also apt to be affected by air contaminated in a particular manner, though we cannot easily trace the specific nature of the taint. And hence the disease assumes an epidemic, as in the former case an endemic range.

But the autumn, which thus peculiarly favours the origin of dysentery and other intestinal affections, gives a like tendency, as we have already seen, to various fevers, and especially to bilious and intermittent. With all these dysentery is particularly disposed to combine, by which the disease is rendered far more complicated; or excites in them a transfer of action, so as to turn aside, in many instances, their regular tenour, and run away with their violence.

When dysentery is accompanied with atonic fever, and a copious discharge of mucous, purulent, bloody, or filmy matter, evidently the result of intestinal ulceration, it is frequently presumed to be contagious; but whether the matter of contagion is thrown forth from the body of the sick, or from the putrescent recrements, has been a disputed point. But the grand question is, whether dysentery ever exists without contagion? or, in other words, whether, when the disease exists without those virulent symptoms which are deemed indicative of contagion, it is entitled to the name of dysentery?

Dr. Cullen, who, if he did not first start this controversy, has followed it up with a more peremptory opinion than perhaps any other writer, has contended for the negative of the question; and has hence not only arranged the disease under his class PYREXIÆ, but generically distinguished it by his character of PYREXIA *contagiosa*: asserting in his Synopsis that he has never met with more than one species; and still more distinctly in his First Lines, that "the disease is always contagious," and that the contagion is probably at all times specific.—(Part i., book v., chap. ii., sect. MLXXV.)

[On the other hand, Sydenham makes no mention of any contagion attending the epidemic dysentery which he has described; and Willis, who speaks of the same epidemic, expressly asserts that it was not contagious.

Although Dr. Bateman believed dysentery to be contagious in camps and hospitals, he never found the disease, as it occurs in this metropolis, to partake of this character. He states that the disease was common in London in a sporadic form in the autumn of 1808; yet, that he never once knew it to pass to a second person in any family, while its origin could be often satisfactorily traced to exposure to cold and moisture. He was therefore disposed to consider Cullen's doctrine as erroneous.—(*Rees's Cyclopædia*, art. DYSENTERY.) The epidemic dysentery which prevailed at Glasgow in the autumn of 1827, and which has been described by Mr. Brown, is also stated by that gentleman not to have been infectious.—(*Glasgow Med. Journ.*, vol. i., p. 55.)]

Dr. Parr and Dr. Young make a nearer approach to the general opinion of Dr. Cullen, than any other nosologists that I am acquainted with. They regard the disease as an inflammatory affection; but differ from Dr. Cullen, inasmuch as they do not believe it to be essentially and at all times contagious: the former limiting himself to the expression that it is *generally* so; the latter, that it is *often* so.

The earlier nosologists, however, have laid little or no stress on either the pyrectic or the contagious character of the disease; and hence in Sauvages, Linnæus, Vogel, Sager, and Macbride, it occurs as a genus under the division, not of fevers, but of fluxes, without any notice of fever or contagion, except as a distinctive symptom in some of their species.

The practitioners in warm climates, and even the monographic and clinical writers of our own country to the present moment, are as little agreed upon the subject of a specific contagion. Pringle, Hunter, Harty, Balfour, and Chisholm, contend strongly for the existence of such a principle; the last of whom asserts that "few diseases are more apt to become contagious."—

(*Climate and Dis. of Tropr Countries*, p. 54, 8vo., 1822.) Johnson, Ballingall, Bampfield, and Dr. L. Frank, either deny it altogether, or have not met with any instance of it in their own practice. [Dr. Renton also, in his description of the dysentery of Madeira, distinctly affirms, that "the disease is certainly not contagious. The lower orders of the inhabitants, its principal victims, live huddled together in close crowded sties; but (says Dr. Renton) I have never seen two cases in the same family at the same time." —(*See Med. Chir. Trans. of Edinburgh*, vol. ii., p. 376.)] So in the late alarming attacks of this disease in Ireland, it was not regarded as contagious *at that time* at Cork by Dr. Barry (*Dublin Hospital Reports*, &c., vol. iii., p. 10), or at Limerick by Dr. Perston (Id., p. 81): while Dr. Halloran, practising also at Cork (Id., p. 9), observes, that it was obviously contagious on many occasions; Dr. Poole that it was contagious at Waterford (*Dublin Hospital Reports*, &c., vol. iii., p. 7); Mr. Dillon that it was the same at Clonmell (Id., p. 5); and Dr. Cheyne, to whom we are indebted for the best, as well as the most extensive, clinical history of this disease, that it was at Dublin in some cases contagious, and in some not: being decidedly so when connected with continued fever; and uncontagious in its simple form, or when combined with an intermittent. This last opinion harmonizes most with the present author's experience: and especially when the disease has been epidemic or endemic.

This view has the full countenance of another very able and experienced writer of our own day, Dr. O'Brien, of Dublin. He has never found the disease decidedly contagious; but supposes it may become so when the disease is epidemic, and the accompanying fever, in camps or other crowded stations, assumes a malignant or typhous form (*Obs. on the Acute and Chronic Dysentery of Ireland*, &c., Dublin, 1822); being, in effect, the opinion offered concerning it many years ago by Dr. Harty.—(*Obs. on Simple Dysentery and its Combinations*, 8vo.)

In truth, we meet with a like associate process in influenza, from an inflammatory affection and increased secretion in the mucous membrane of the nostrils, instead of in that of the colon: for we have already seen that the disease, at first simply epidemic or atmospherical, at length becomes contagious, and is capable of communicating its like to whatever distance the patient may be removed from the line of tainted atmosphere. And we are hence enabled to enter fully into the following variety of causes, traced out on the spot by Dr. Cheyne in the late extensive call upon the whole of his judgment and talents. "I have analyzed ninety-eight cases. Thirty-three arose during recovery from fever: fifteen while the fever was in progress: fifteen from cold, or cold and wet: four from indigestion. The rest were doubtful: but many had been exposed to febrile contagion, and nine in close communication with patients labouring under dysentery: four had been nurses in wards where the disease had occurred: four had slept with dysenteric patients, of whom one had used the same night-chair."—(*Medical Report*, &c., p. 18.) We may here readily subscribe to his own language, and say, "it has rarely fallen to the lot of a physician in civil life, possessing all the advantages of books, and of consultation with skilful and experienced colleagues, to witness dysentery upon such a scale."

[In a later paper on the subject, Dr. O'Brien speaks of one of his patients, who supposed that he caught the disease either by lying near another person affected with dysentery, or by using the same night-chair. One other instance occurred, Dr. O'Brien remarks, in which a tolerably strong presumption at least existed of the propagation of the disease by contagion; viz., the case of Kelly, the whole of whose family, amounting to six in number, were attacked in succession. But Dr. O'Brien has met with no other strong or probable instance of the communication of the disease by contagion.*] Dr. Cheyne tells us, that Dr. Prevost, of Geneva, at that time one of the clinical clerks of the Whitworth Hospital, conceived he had contracted the disease he was then labouring under in the *dissecting-room*, where he spent much of his time *hanging over the bodies* of those who had died of dysentery.—(*Dublin Hosp. Rep.*, vol. iii., p. 18.)

When the disease has run through its acute stage with great severity, but without destroying the patient, and not unfrequently, perhaps, when it has been something less severe, but unskilfully treated, it assumes a chronic character, exhibits symptoms peculiar to itself, and, as Sydenham observes, will continue to afflict the patient for several years. In this case, the structure of the liver, as well as that of the intestines, is almost always injured. If the lesion be not considerable, the patient may at length recover; but very generally the termination, though protracted, is still fatal. Dr. L. Frank, indeed, regards it as even more fatal than in the acute form.

It is not always that the disease under this shape is a sequel of acute dysentery, and especially among those who have predisposed themselves to it by an antecedent life of intemperance. Dysentery has, on this account, of late years, by many writers, both at home and abroad, been divided as a genus into the two species of acute and chronic, the pyrectic form being contemplated as a variety of the acute division:—

1. Dysenteria Acuta. Acute Dysentery.
2. ——— Chronica. Chronic Dysentery.

* Trans. of King's and Queen's College of Physicians, vol. v., p. 227, Dublin, 1828. Dr. Elliotson observes, that the sporadic cases which are occasionally met with in this country among persons who have returned from hot climates, are certainly not contagious. Without denying that the disease may be contagious in warm countries, he expresses his belief that it is not so in England. —Lectures at the Lond. Univ., as published in Med. Gaz. for 1833, p. 556.—Ed.

SPECIES I.
DYSENTERIA ACUTA.
ACUTE DYSENTERY.

FECES DISCHARGED WITH DIFFICULTY, MOSTLY IN SMALL QUANTITIES, AND ALTERNATING WITH MUCOUS OR BLOODY DEJECTIONS; PAIN OR TENDERNESS IN THE ABDOMEN: TERMINATING WITHIN A MONTH.

We have already observed, that the atmospheric temperaments chiefly calculated to produce severe bowel complaints are those of summer and autumn; when the liver is excited to a larger secretion of perhaps more pungent bile, from the greater heat of the weather; the skin is exposed to more sudden transitions from free to checked perspiration; and the exhalations that rise so abundantly from marshes and other swamps too often give an epidemic character to the atmosphere, and lay a foundation for intermittent and remittent fevers: and we may hence see why dysenteric and other bowel affections, like intermittents, were far more common in our own country about a century ago than they are at present; the soil being more generally drained, and the atmosphere less humid.

We have here also sufficient ground for local and general affection, and may readily see how it is possible, from the operation of one of these causes singly, or of two or all of them jointly on an irritable state of the intestines, for all or any of the local symptoms to be produced which enter into the generic or specific definition of the disease before us; as also how it is possible for these symptoms to be combined with fevers and other disorders of various kinds and various degrees, so as to render the complaint peculiarly complicated and dangerous; though we have not yet been able to find out what are the precise causes, that, operating locally, produce the distinctive symptoms of dysentery, rather than those of diarrhœa, cholera, or any other irritation or spasmodic action of the intestinal canal. This may, perhaps, sometimes depend upon idiosyncrasy, sometimes upon accident, and, in the severer cases, upon contagion or a specific miasm.

The symptoms, however, already noticed, sufficiently point out the general seat of the disease: the tormina or griping pains, the region most affected by them; and the costiveness or nodules of feces that are dejected, the existence of spasmodic constriction in or about the colon, or the upper part of the large intestines. And while such is the state of the canal above, the excessive straining or tenesmus, accompanied with a discharge of simple or bloody mucus, shows as distinctly the existence of great irritation in the sphincter or its vicinity. In some cases, one of these parts is more affected, and in some another: and hence the origin of most of the disputes concerning the precise spot of the disease.

The ordinary exciting cause, however, of acute dysentery, under all its varieties of fixation, there can be little question, is suppressed perspiration, or a sudden chill applied to the *surface*, acting in conjunction with the predisposing cause of an atmosphere varying rapidly from heat to cold, and from moist to dry; but by what means this exciting cause operates upon the larger intestines rather than upon any other cavity, or produces the symptoms of dysentery rather than those of diarrhœa, cholera, or colic, we seem to be incapable of determining. We perceive, however, in the events of every day, that sudden chills on the surface are possessed of a revellent power, and throw the action which is lost on the skin on various internal organs, and especially on cavities of mucous membranes, which, in consequence of this excitement, become inflamed, and pour forth an additional secretion. Such is especially the case in rheumatism and catarrh, both which terms are derived from the same Greek root, and import defluxion. And, from this common character, the three diseases have by some pathologists been conceived to be so much alike, that dysentery has been regarded as an intestinal rheumatism by Cælius Aurelianus, Akenside, Stoll, and Richter, and is actually set down by Dr. Parr as a species of catarrh, in his nosological classification.

We also see why dysentery, like catarrh, may be either sporadic or epidemic; as also why, in each case, it may be either slight, and pass off without any serious evil in a few days, or accompanied with great inflammatory action and continued fever; thus giving rise to the two following varieties:—

α Simplex. Simple acute dysentery.	Feces often discharged without considerable pain; of a natural quality and affording ease: abdominal tenderness unheeded.
β Pyrectica. Pyrectic dysentery. Dysenteric fever	Stools frequent: in every way diversified, both in colour and consistence: severe pain in the abdomen: fever considerable, mostly a synochus.

These are the two varieties under which acute dysentery is described by Sydenham, who indeed limits himself almost entirely to these forms of the disease, since, though he notices the second species, or chronic dysentery, he merely glances at it in a kind of postscript to his chapter. Yet his description of both is so accurate, and his general mode of treatment so judicious, that they have received the sanction of the most approved pathologists from his own day to the present.

As the local inflammatory action is more usually traced in the colon than elsewhere, Stoll (*Rat. Med.*, part iii., pp. 294, 326) and various other writers have fixed upon this intestine as its proper seat; and hence Dr. Ballingall has distinguished it by the name of *colonitis*.*

Although, in dysentery, the primary seat of inflammatory action is the intestines, yet the functions of the skin and of the liver are from

* In the Dict. de Méd. it is described under the name of *colite*.—See tom. v.—Ed.

the first, as well as throughout the whole course of the disease, considerably disturbed by sympathetic excitement. The liver, however, suffers in many instances, not only on this account, but from a continuous spread of the inflammatory action through the medium of the biliary ducts, and becomes injured in its organization as well as in its function. Some pathologists, as Dr. Chisholm, conceive that they can trace this extension of the inflammatory process to the liver by particular symptoms, as a fixed pain at the stomach, a constant headache, and frequent dejections at the commencement of the disease; and they have consequently given us a distinct division of it, under the name of *hepatic dysentery*. It is sufficiently ascertained, however, that the structure of the liver has been often considerably affected, and even destroyed, when neither these or any other peculiar symptoms have presented themselves; and hence it is a distinction which can be made no use of. A frequency of dejections at the commencement is rather an anomalous fact than a pathognomonic sign: while, as to the other two indications, it is admitted by Dr. Chisholm himself, that they are "apparently NOT characteristic symptoms;" in other respects, says he, "the disease does not seem to differ from the idiopathic or common dysentery."

Some writers, however, as Piso (*Discours sur la Nature, &c. des Maladies accompagnées de Dysenterie*, 1623) formerly, and Dr. James Johnson in our own day (*Influence of Tropical Climates, &c.*, edit. 3, p. 197), have carried this view of the subject considerably farther than my late learned and venerated friend Dr. Chisholm ever intended; for they have boldly reversed the general opinion that has prevailed, and especially since the days of Sydenham, and contended that the liver itself forms in every instance the primary seat of the disease, the intestines being only affected secondarily. Whence the latest of these two distinguished authors has ventured a scoff at the pathology of Sydenham, "who," says he, "it is our firm belief, never examined a dead body after he left his academical studies; at least he has given us no indication of pathological knowledge in any of his works." —(*Med.-Chirurg. Rev.*, March, 1823, p. 830.)

I value Dr. Johnson's friendship, and have an equal value for his talents; but I cannot concur with him in thus tearing from the temples of an illustrious countryman the wreaths of honour he has so deservedly earned, and which have been bestowed on him by our best foreign as well as domestic judges, from Boerhaave and Sauvages, in the middle of the last century, to the younger Frank in the present day. His language, indeed, is tinctured with the prevailing errors of the humoral hypothesis, which at that period it was impossible altogether to avoid, and which is again rising into notice in some quarters; but, sifted of this, his pathological doctrines are those of the present day, to which in the main they have given rise; and better stand the test of dissection than those of Dr. Johnson himself. "His observations," says Dr. Bostock, "will be commonly found to be correct, although his hypotheses are too often fallacious."—(*Physiology*, vol. i., p. 448, 8vo., 1824.) These "observations" teach us, in few words, that dysentery is an inflammatory affection of some part of the larger intestines, which, in its idiopathic and milder state, subsides without serious evil in a few days; but which, occurring in the autumn, is apt to associate itself with whatever febrile epidemy is then prevalent, to become a far more important and complicated malady, and to ravage over a much larger field of organization; the fever aggravating the dysentery, and the dysentery the fever; while, not unfrequently, a metastasis ensues, and the fever is thrown upon the intestinal canal, and expends its violence topically: during which vehemence of action a peccant material (the contagious principle of Dr. Cullen) is elaborated in the constitution and thrown out on the surface. To oppose all which, he lays down a therapeutic plan which evinces an equal degree of judgment; and consists in bleeding, purging, diaphoresis, and opium; in other words, in taking off congestion and inflammatory action, in allaying irritation, and restoring to the circulatory system its proper balance. It may perhaps be said by some modern writers, that he did not always carry these principles far enough. Possibly not in every instance; but this must altogether depend upon the severity of the disease. And we have a proof, in his own success, that he carried them far enough in general; while his great merit consists in the establishment of such principles, and in squaring a correct line of practice to a correct pathology. It may also be objected, that calomel does not appear to have entered into his list of deobstruents. That he did not use it among other *cathartics*, shows evidently that his cathartic catalogue might have been improved; but to have employed it as a *sialagogue*, and to have *depended* upon curing the disease *almost exclusively*, as his loudest opposers have endeavoured to do, by ptyalism—however valuable such a process may be in a few instances, would not, I fear, have added to his reputation, or increased the number of his followers.

Had the animadversion, indeed, which I have thus felt it my duty to notice, been delayed but a few months, it is most probable that it would not have been advanced at all. For while the learned writer who has made it had already to struggle with perhaps a majority of the most judicious tropical writers, in denying the existence of contagion at all times, and regarding the very opinion as absurd (*Influence of Tropical Climates*, edit. 3, p. 223), he would have found in the admirable treatises on dysentery which have since been furnished us from Ireland, not only that this opinion, as already observed, seems to have a firm foundation under particular circumstances, but that his favourite doctrine, that the liver is the primary seat of the disease, is completely unhinged; as also that his favourite plan of treatment has as little succeeded here as it did in India under Dr. Ballingall, or, as Dr. Frank informs us, it did in his hands in Egypt during the occupation of that country by the French army.

The diagnostics of the first variety, or SIMPLE ACUTE DYSENTERY, unaccompanied with the prevailing fever of the season, are thus accurately laid down by Sydenham :—

"But frequently there is no appearance of fever; for the host of gripings take the lead, and the dejections follow. The gripings are always severe, and a sort of painful descent of the bowels accompanies every evacuation. The discharges are chiefly mucus, but an excrementitious stool sometimes intervenes without considerable pain. The mucous stools are generally streaked with blood; but, in some cases, there is no such appearance through the whole course of the disease. Nevertheless, if the stools be frequent, mucous, and accompanied with gripings, the disease may as justly be called a dysentery as if blood were intermixed with them."

These constitute the ordinary symptoms of the simple variety. And to the same effect Dr. Cheyne :—"When dysentery was unconnected with continued fever, which apparently was often the case, there was nothing peculiar in its origin. The patients generally assigned cold, damp, fatigue, hardships, indigestible food, as the causes of their disease, which began with confinement of the bowels, chills, pyrexia, tormina, unsatisfactory stools, and tenesmus."—(*Dublin Reports*, vol. iii., p. 18.) It is correctly observed by Dr. Chisholm, that, "when, after the straining has continued for a few days, the stools are intermixed with blood, the blood never thoroughly combines with the slime or mucus so as to produce a uniform colour" (*Climate and Diseases of Tropical Countries*, p. 54), but, as Sydenham observes, "appears distinctly or in streaks."

It is remarked by several of the practitioners in India, and especially by Mr. Bampfield, that the dejections are more frequent during the night, and especially towards morning, than at any other period of the twenty-four hours: and that the attacks and relapses of the disease are more common at new and full moon, than at any other period of the lunar revolution: and the influence of the heavenly bodies is referred to as the cause of these peculiarities.—(*On Tropical Dysentery*, 8vo., 352, 1819.) The remark does not seem to be sufficiently established.

In its most favourable course, the symptoms gradually subside in a week or ten days, and sometimes even sooner, the skin becoming soft and moist, and the circulating fluid recovering the natural freedom of its current. If the symptoms augment, all the local mischiefs of ulceration and gangrene follow, which we shall have to describe presently, or the disease will become CHRONIC.

In the SECOND VARIETY, OR DYSENTERIC FEVER, as it is called by many writers, all the preceding symptoms are highly aggravated, and others are superinduced by the action of the fever itself.

The preceding variety may occur at any season of the year, though, for reasons already stated, the disease, under every form, is most frequently to be met with in the estival and autumnal months: it is very rarely, however, that the pyrectic variety is to be found in any other than these two seasons; nor even in these, unless there be some endemic or epidemic fever prevailing, with which dysentery can combine.

Of its readiness to do this, and even to convert almost all the other diseases of the season into its own form, so forcibly pointed out by Sydenham, the late ravages in Ireland have furnished us with the most undeniable proofs. "The bilious fever of the autumn," says Dr. Cheyne, "continued till near the termination of winter; consequently it existed as long as the dysentery was prevalent in the hospitals and the House of Industry, or the symptoms were often exchanged for those of dysentery, the irritation from the mucous membrane of the stomach and small intestines probably extending to the large."—(*Dublin Reports*, vol. iii., p. 17.) And again, "dysentery was sometimes converted into fever, while, *vice versâ*, fever was converted into dysentery: in short, these forms of disease were convertible the one into the other; so that the opinion of Sydenham, that dysentery is a *febris introversa*, or *turned in upon the intestines*, received support from our observations. And it is not unreasonable to suppose, that as these patients in my wards, in common with most of the poor in the city, had been exposed to the contagion of fever; this CONTAGION, according to the condition of the system at the time of its application, or some other modifying circumstance, may have produced at one time fever, at another dysentery."—(Id., p. 19.)

And so of other diseases as well as the prevailing fever of the season. "In early autumn, cases of cholera degenerated into dysentery, and, in the spring following, symptoms of dysentery accompanied the measles, then epidemical in many parts of Ireland."—(Id., p. 16.)

It is from the peculiar tendency which dysentery has to unite with other diseases, and especially fevers, or to convert them into its own nature, that many pathologists of considerable name have regarded it as nothing more than fever with a peculiar "local mode of action," to adopt the language of Dr. Jackson. And they hence endeavour to show that, when dependant upon a cause of endemic fever, it is often intermittent; when dependant upon a cause of contagious fever, it is contagious (*Jackson, Hist. and Cure of Fever*, part i., ch. xiii., p. 324); and, when dependant upon a cause of typhus fever, it is malignant or putrid;—in the language of Dr. Balfour, as applied to the dysentery of India, a "*putrid, intestinal, remitting fever.*"—(*On Sol-lunar Influence*, p. 17.)

Most of the French writers of the present day describe dysentery as essentially an atonic or adynamic disease, and hence peculiarly apt to fall into this last form: and Dr. L. Frank represents this as the form it assumed, with little deviation, among the French army in Egypt, and believes it to be the ordinary form of hot climates.—(*Consult.*, lix., T. H., p. 135.) And we can hence see, where there is much fibrous debility with but little fever and especially

where this is produced by poverty of diet, that it may occasionally connect itself with that kind of scorbutic affection which appeared some time ago among the convicts of the Millbank Penitentiary, and laid a foundation for such a form of the disease as was long ago denominated *dysenteria scorbutica* by Cirigli and Brambilla (*Phlegm.*, tom. ii., p. 337), and has been distinguished by the same name, in our own day, by Mr. Bampfield.—(*Practical Treatise on Tropical Dysentery, &c.*, 8vo., 1819.)

In the pyrectic variety, therefore, the fever is found to vary according to the diathesis or surrounding circumstances. The functions of the liver and skin are disordered from the commencement, and continue so till the termination. In the dysentery at Dublin, in the autumn of 1818, the skin was obstinately dry, hot, and pungent; and, "judging," says Dr. Cheyne, "by the appearance of the stools, the biliary secretion was often suspended for many days." —(Op. cit., p. 22.) Scybala were here never found in the discharges, nor often in the intestines; and they by no means appear so frequent as have been represented by many writers; insomuch, indeed, that it has of late been doubted by some authorities whether they are ever to be traced at any time or in any country. Dr. Johnson has freely imbibed this doubt (*Johnson*, op. cit., &c., p. 223, et passim): Dr. Ballingall tells us that "it is *comparatively* a rare occurrence in India (*Practical Obs. on Fever, Dysentery, and Liver Complaints*, &c., 2d edit., Edin, 1823): while Dr. Chisholm speaks of them, on the contrary, as an ordinary symptom, and particularly adverts to the case of one patient under his care, who, "on the tenth day of the disease, after a paroxysm of excruciating torture, attended by cold sweats and deliquium, spontaneously discharged at three evacuations a quantity of scybala sufficient to fill a common-sized chamber-pot."—(*Climate and Diseases of Tropical Countries*, &c., p. 56; see also *Cleghorn on the Diseases of Minorca*, p. 252.) There is hence no reason to question their occasional formation, notwithstanding they are rarely to be traced on many occasions in the dysentery of any climate: their production, indeed, is easily accounted for, from the spasmodic constrictions which so often run through a very considerable range of the intestines: and there is hence, *primâ facie*, more reason for anticipating than for not expecting them. Mr. Pack, who had formerly witnessed them in the Mediterranean, was surprised at not meeting with the same appearance at Kilkenny, in the epidemy of 1818, and could not avoid adverting to the dissimilarity of the disease in this respect in these distinct quarters.—(*Dublin Reports*, &c., ut suprà, p. 20.)

The patient, on going to stool, whatever be the discharge that ensues, has always a feeling of something remaining in the bowels which ought to be dejected; while the dejections themselves, according to the extent and violence of the inflammatory action and its effects, evince every combination of materials: being in consistency watery, like beef-washings, slimy, mucous, purulent, bloody; in hue, drab-coloured like flummery, bright green like conferva, and, after opium and calomel, deep green; sometimes pitchy (*O'Brien on Dysentery*, p. 58), and extremely fetid: and sometimes loaded with shreds of detached membranes; while occasionally a feculent motion is thrown down, of a natural colour, and nearly of a natural spissitude. Meanwhile, to adopt the description of Sydenham, the strength is much exhausted, the animal spirits dejected; there are all the signs of an ill-conditioned fever; intolerable sickness and excruciating pains, and a deadly coldness of the extremities; insomuch that the disease, in many instances, and especially when unskilfully treated, endangers the patient's life much earlier than in most other acute diseases. But, if the patient should escape death in this way, still numerous symptoms of different kinds succeed. Sometimes, in the progress of the disease, instead of the membranous shreds which are usually mixed with the stools at the commencement, pure blood, unmixed with mucus, is profusely discharged at every evacuation, which of itself threatens death, as manifesting an erosion of some of the larger vessels of the intestines. Sometimes a fatal gangrene seizes the intestines. Towards the close of the disease, aphthæ frequently affect the interior of the mouth, and generally foreshow imminent death.

The rapidity with which acute dysentery, when connected with fever, rushes on to destruction, is particularly noticed by Dr. Cheyne, who ascribes the fatal issue in this case to the violence of the fever itself, rather than to the proper dysenteric symptoms: though he adds, that sometimes sudden death ensued from an escape of the contents of the intestines into the cavity of the peritoneum, in consequence of ulceration. —(Ubi suprà, p. 20.)

The afflux of hot acrid matter alluded to by Sydenham is not unfrequently derived from the liver, and indicates a very morbid condition of this organ; and to the same effect Dr. Johnson:—"We sometimes see a partial, ill-conditioned sweat on the surface, which is productive of no benefit; while from the liver an occasional gush of vitiated bile, like so much boiling lead, throws the irritable intestines into painful contortions, and then the tormina and tenesmus are intolerable."—(*Influence of Tropical Climates*, ut suprà, p. 194.) There is occasionally, at this time, a formation of black vomit, the stomach discharging frequently a dark fluid, with a precipitate like coffee-grounds.—(*Dublin Reports*, vol. iii., p. 32.)

Dr. Chisholm observes, that the principal signs of the disease having extended to the liver are, a "pain at the pit of the stomach and a headache, a considerable anxiety at the præcordia, and a sensation as of a continued pressure in the right hypochondrium, with frequent stools, composed of a fluid like the washings of raw meat."—(Ubi suprà, p. 59.) But he admits, as we have already noticed, that these are not idiopathic, and, consequently, are not to be depended upon for this purpose. They prove, however, that the disease has made an exten-

sive inroad upon the constitution. Not unfrequently the lungs themselves are affected, not merely in their function, but in their structure: for their respiration, observes Dr. Cheyne, was sometimes suddenly suppressed in the advanced stages; there was pain in the chest, a teasing, dry cough, showing a translation of the disease to the lungs; an exudation of puriform mucus in the cavity of the bronchia being detected on dissection.—(Suprà, p. 25.)

"A harsh, dry, opaque, dirty-looking skin; a florid, clear, varnished tongue; vigilance; a hollow eye, and pallid, wasted, faded cheek; pains in the knees; cramp in the legs; fits of dyspnœa; tendency to œdema and ascites—belonged to the more advanced stage, but not to the last, which was characterized by extreme emaciation, supine posture, involuntary stools, a thin reddish secretion, flowing without check; sordes on the teeth; hiccough; tendency to delirium; difficulty of swallowing; thread-like pulse."—(Suprà, p. 23.)

The mortality is often dreadful. At Clonmel, in 1818, where, however, it was far less severe than in many other parts of Ireland, Mr. Dillon calculated the deaths at one in ten; at Cork, during the same year, Dr. Barry estimated it at one in three at the least. "I never," says he, "witnessed so fatal a disease." And to the same effect, in general terms, Dr. Cheyne, while practising at Dublin: "I had often witnessed obstinate cases of dysentery, but I had not formed an adequate conception of the horrors of that disease, until I saw the patients who were congregated in the wards of Whitworth Hospital." [Sir James M'Grigor, in his Account of the Diseases of the Army in the Peninsula, mentions that, in three years, the loss from the ravages of dysentery was 4717; and Dr. O'Beirne (See *Trans. of King's and Queen's Coll. of Physicians*, vol. iv., p. 407, Dublin, 1824), calculates that the number of cases was 40,000. According to Desgenettes, dysentery made more havoc among the French troops in Egypt than the plague; for while, in a given period, 1689 were carried off by the plague, 2468 perished from dysentery.]

Post-obit examinations were made in the dissecting-room of the Whitworth Hospital upon a very extensive scale, and gave evident proof, first, that the primary and chief seat of the disease was the intestines; though the liver often participated in the general lesion; and, secondly, that the intestinal canal was very variously diseased, according to the length or severity of the attack, or the peculiarity of the patient's constitution.

In some cases, the canal was prodigiously distended; in others, the coats were greatly injured, but without any thickening; in others, again, they were considerably thickened, as well as otherwise diseased.

Where distention prevailed, the small intestines were in a few instances found to be not less than seven, and the large not less than nine inches in circumference.

Where the intestinal coats were *without incrassation*, the inflammation of the mucous membrane was sometimes still very extensive, and reached from the stomach to the rectum; being, however, more obvious as the larger intestines were approached; though occasionally this last intestine was still pretty sound for three or four inches above the sphincter. The vascularity of the mucous membrane was sometimes increased without abrasion or ulceration: sometimes the same part was covered with coagulable lymph; sometimes simply abraded of its epidermal coat; sometimes partly ulcerated, and irregularly exposing the muscular coat; the intervening portions being of a natural appearance.

Where the intestinal coats were *thickened*, the mischief seems to have been generally more severe; the internal surfaces were often rugose as well as ulcerated, exposing the muscular fibres more extensively, which often hung in shreds as if sphacelated. The process of thickening, moreover, belonged to the more protracted cases, and often measured the duration of the disease.—(*Medical Report*, &c., pp. 28, 34.)

This incrassation is traced chiefly in the colon, which Dr. Chisholm has found sometimes a quarter of an inch thick, and full of minute abscesses, and small steatomatous excrescences. (*Climate and Diseases of Tropical Countries*, p. 56.) These last appearances are particularly noticed by Dr. Cheyne, but described differently: "they are not," says he, "small ulcers, but minute pinholes formed out of the enlarged ducts of mucous glands; they were found very numerously, but especially in the rectum and lower part of the colon." By Dr. Baillie they are described as excrescences resembling warts. —(*Morb. Anat.*, fascic. iv., pl. iii., p. 73.)

"The liver," says Cheyne, "in a majority of cases, was sound, but often otherwise. In *two* cases there were abscesses; and in many, great sanguineous congestion."—(*Medical Reports*, &c., p. 36.) To a like effect Dr. O'Brien, writing from the same capital at a later period: "Generally," says he, "the liver was unaffected; though the gall-bladder was always distended with deep-brown or dark-yellow bile."—(*Observ. on the Acute and Chronic Dysentery of Ireland*, Dub., 1822.) Both these appearances were particularly observed by Dr. Chisholm in the West Indies, thus again harmonizing the nature of the disease in climates of different temperatures. "Where the colon was thus diseased, it was prodigiously distended with air. All the rest of the intestinal canal was healthy, the liver was equally so; but the gall-bladder was of a most uncommon size, and full of yellow bile."—(*Climate and Diseases*, &c., p. 57.) The same undeviating show of mischief in the intestinal canal, with only an occasional appearance of morbid structure in the liver, occurred to Dr. Ballingall in India, and to Dr. L. Frank in Egypt: so that the real source of the disease can be no longer a matter of doubt. "The dissection of every subject," says the former, "who died of dysentery in the regimental hospital of Penang (with one solitary exception), proved the disease to consist entirely in an inflammatory affection of the

large intestines, without a trace of disease in the structure of the liver."—(*Pract. Obs. on Fever, Dysentery, and Liver Complaints*, &c., Edinb., 1823.)

[In a late essay (See *Trans. of King's and Queen's College of Physicians*, vol. v., p. 249, Dublin, 1828) on the present subject, Dr. O'Brien has recorded the dissections of twelve dysenteric patients. The summary is as follows: liver diseased in six; spleen in three; small intestine (chiefly ileum) inflamed, or ulcerated on its mucous surface, in eight; great intestine diseased in twelve; gangrenous in one; much contracted in two; ulcerated and inflamed in all; colon and rectum parts most diseased.]

The MEDICAL TREATMENT of dysentery has given rise to much warfare of opinion. Not, however, in slight cases of the simple acute disease; for such usually give way in a short time to the ordinary evacuants and sedatives. "In cases," says Dr. Cheyne, "not attended with much fever or pain, and in the first few days of disease, a purgative in the morning, ten grains of Dover's powder in the afternoon, and again at bedtime, with low diet, restored many." —(*Medical Report*, &c., p. 42.)

Sydenham generally commenced with bleeding, gave an opiate at night, and a pretty active purgative in the morning: the purgative consisting of a drachm and a half of rhubarb, two drachms of senna, with half an ounce of tamarinds, infused in a sufficient quantity of water, with manna and sirup of roses. The purgative was repeated twice every other day, and in every instance followed up with an anodyne of sixteen or eighteen drops of his own potent laudanum, to take off whatever additional excitement the purgative might produce. The same anodyne was constantly given with a warm diaphoretic, every night and morning, even on those days when the aperient was not employed.

Where this was insufficient, the sedative was repeated every eight hours to the amount of twenty-five drops at a dose, and a perspiration was still further attempted to be promoted and maintained by drinking freely of whey or the white decoction, and the use of warm emollient injections; the perspiration being continued for at least twenty-four hours at a stage, the only beverage allowed in the meanwhile being tepid milk.

The tormina and bloody stools usually gave way after the third or fourth injection. But where the morbid secretion ran into a chronic character, he varied the form and intention of the injection; and, with a view of introducing a new and less unhealthy action, compounded it of half an ounce of Venice turpentine dissolved in a pint of cow's milk, which was thrown up daily; thus anticipating, in a very considerable degree, the modern practice of obtaining the same effect by the balsam of copayva, which is only a terebinthinate of another kind.

The *principles* of this practice it is not easy to improve upon; though they have since been modified and often extended with considerable advantage.

As a general rule, the lancet was had recourse to with too much timidity; though its present indiscriminate and lavish employment forms an extreme that ought equally to be avoided. Where the fever is considerable, the pulse hard and full, and particularly where there is much general pain and tension over the belly, indicating an inflammatory diathesis, blood should be drawn copiously and with all possible speed, and repeated as long as the same symptoms may require; for here we have no time to lose; the inflammation may run rapidly into gangrene, and the patient sink from mortification or loss of blood in a day or two; perhaps in a few hours. There is nevertheless no disease that requires the exercise of a sounder judgment upon this point than dysentery; as the fever, if not typhous from the first, has a general tendency to pass into this type. [The statement of Dr. Renton, who has given a description of dysentery as it appears in Madeira, corroborates the necessity of great caution; for he says that he was once in the habit of using the lancet freely and repeatedly, and of trusting to it and other antiphlogistic means; but *every case* so treated terminated fatally.*]

In his cathartic plan, Sydenham would have been considerably aided by the use of calomel; of all the purgative deobstruents the most valuable; and the more so, as exercising its evacuating power over all the secernents of the body. It has of late, indeed, been most extensively employed in quite a different way, and for a very different object; that, I mean, of curing by a specific action upon the immediate seat of inflammation; being persevered in for this purpose in doses of from five or ten to twenty or twenty-five grains, two or three times a day; assisted, where there is much torpor of the absorbents, by mercurial friction, and continued till ptyalism is produced, which, as in the case of yellow fever, is the alleged test that the constitution is sufficiently loaded with it, and that the disease is about to give way.

It is impossible to contemplate the conflicting opinions which are given us respecting this mode of treatment by the monographic writers on tropical diseases, without astonishment: and the only mode of reconciling them is, to suppose that the constitution is very differently affected by the use of mercury under different circumstances; and that, while in some epidemics and sporadic cases it produces all that benefit which *à priori* we should expect generally, in others it entirely fails, or even proves mischievous. Dr. Jackson, Dr. Ballingall, and Mr. Bampfield, feel justified in employing calomel merely as a purgative; while the second, though he regards it as of the highest importance in chronic dysentery, found even ptyalism itself unsuccessful in the acute form. Dr. John-

* Edin. Med. Chir. Trans., vol. ii., p. 381. In acute dysentery, a decidedly antiphlogistic plan is recommended by Dr. Elliotson:—"It may be necessary to bleed vigorously in the arm; to apply leeches freely and repeatedly to the abdomen; to give mercury, and get the mouth sore; to apply cataplasms of hot moist bran to the abdomen," &c.—Lect. at Lond. Univ., as published in Med. Gaz. for 1833, p. 556.—ED.

son esteems it of high importance as a purgative, but of the utmost moment as a sialagogue. He unites it occasionally with bleeding, with anodynes, with diaphoretics, or with all; but each of these is subsidiary to its powers, and may often be dispensed with.—(*Influence of Tropical Diseases*, &c., p. 202.) Mr. Annesley unites it in the same manner, but takes every method in his power to prevent it from becoming a sialagogue. In any of the diseases for which he prescribes it, as fevers, dysentery, and liver-complaints, he gives it in scruple doses in each. "I never wished," says he, "to see the mouth in the least degree affected. Whenever this happened, I considered the salutary effects of calomel interrupted, because its use must be then discontinued; and it was my object to act upon the secretions of the intestines, to diminish muscular action in the intestinal canal, and not in the most remote degree to act upon the salivary glands." —(*Practical Observations on the Effects of Calomel on the Mucous Surface*, &c., Lond., 1825, 8vo.) Mr. Cunningham, late surgeon to the Sceptre in the East Indies, boldly employs it alone, and regards every thing else as impeding its course. He does not even stand in need of alvine aperients of any kind, and prefers scruple doses to smaller proportions, because it does not in this form so readily excite the alvine discharge, so as to be carried out of the system by stool: and, administered in this way, he fearlessly asserts, and the tables of his practice seem to justify his assertion, that "it is an almost certain remedy for dysentery, in hot climates at least." [Dr. Renton, of Madeira, after having given a trial to almost all the various modes, from copious bloodletting down to the oil of turpentine, feels himself justified in stating, after some years' experience, that, in the treatment of the dysentery of that island, "mercury, given boldly and perseveringly, until the mouth becomes decidedly affected, is the remedy chiefly entitled to confidence."—(*Renton, in Edin. Med. Chir. Trans.*, vol. ii., p. 377.) His plan is to give calomel every three or four hours, until the gums become sore.] And, finally, for it is not worth while to pursue the discrepance further, Dr. L. Frank assures us, that, in his practice, the large doses of calomel given so generally by the English surgeons in India, proved dangerous in the French army in Egypt; and that the plan most successful in his hands, was that laid down by Sydenham, which consisted, says he, in removing irritation by gentle aperients, the use of emollient injections, mucilaginous and diluent drinks, diaphoretics, and laudanum.

Sydenham employed laudanum as a cordial and diaphoretic, as well as a sedative; so as to take off that fearful depression of the animal spirits by which dysentery is so peculiarly characterized, and to give a breathing moisture, and consequently a refreshing coolness, to be parched and burning skin, as well as to allay local irritation; his chief auxiliaries for the last purpose being diluents, tepid injections, and the warmth of the bed. Modern practice has *greatly* improved upon this plan, by combining some relaxant with the opium; and, in many instances, by premising an emetic, which, independently of its often exciting a perspiration, which nothing else can accomplish, has the additional benefit of emulging the meseraic or mesenteric vessels by the act of vomition. The antimonial preparations form the best emetics for this purpose, whether the glass of antimony, at one time so powerfully recommended by Sir George Pringle (*Edin. Med. Essays*, vol. v., art. xv.), tartarized antimony, or Dr. James's powder. Sir George Baker, Dr. Adair, and Dr Saunders, concurred in strongly recommending the emetic tartar as a diaphoretic or relaxant; the first alone, the second with calomel, and the third with opium; all which, nevertheless, have, in our own day, often yielded to Dover's powder, which is certainly entitled to a very high degree of praise. Much, however, of the benefit to be derived from Dover's powder, as a sudorific, depends upon its proper administration, and the care taken to promote its influence by a proper adjustment of clothing. Dr. Cullen advises, that the patient should, from the first be wrapped in a flannel shirt, and laid between the blankets alone, by a removal of the linen sheets, so that he may be surrounded by nothing but a woollen covering. Mr. Dewar's recommendation (*Obs. on Diarrhœa and Dysentery*) of a broad flannel swathe or cumberland bound round the abdomen, is, however, better entitled to practice, as it affords support as well as warmth: Sir James M'Grigor found it very useful.*

Dr. Darwin amuses us with a singular mode of producing the same result, and one which, if continued long enough, might probably prove as powerful a revellent as any of those already noticed, but which we should not always recommend, nor find our patients disposed to carry into effect. "Two dysenteric patients," says he, "in the same ward of the Infirmary at Edinburgh, quarrelled, and whipped each other with horsewhips a long time, and were both much better after it."—(*Zoonom.*, cl. ii., i., 3, 19.)

If the flux of blood, or any other morbid material, continue and be considerable, and especially if there be still an intermixture of sanious grume and shreds of membranes, evidently proving vascular disintegration and the approach of gangrene, astringents and tonics must enter into the plan of treatment. And, in this case, great benefit has been obtained from mineral acids, in union with sulphate of zinc or with opium.

The former combination was a favourite medicine with Dr. Moseley, who, of the mineral acids, preferred alum, and varied the proportions according to the strength or age, the degree of costiveness or of hemorrhage, of the patient: sometimes giving two or three grains of each at a dose, to be repeated three or four times a day; where the hemorrhage is considerable, increas-

* Medico-Chir. Trans., vi., 433. Dr. Elliotson has not a favourable opinion of the emetic plan, neither has he ever been able to discover the soothing effects of ipecacuanha. He has not judged it necessary to give preparations of antimony.—ED.

mg the alum; and, where feculent evacuations were required, diminishing it, or even omitting it altogether. The preparation is valuable, as it unites a powerful metallic tonic, which is a true character of the sulphate of zinc, with an acid which has the singular virtue of proving astringent to the sanguineous and secernent system, while it produces little effect upon the peristaltic motion, and by some physiologists is thought rather to quicken it. Dr. Adair employed alum alone; but it is greatly improved by the addition of the sulphate of zinc. Dr. Jackson recommends either, or both conjointly; and both himself and Dr. Moseley employed injections at the same time, composed of a solution of acetate of lead, and apparently with great benefit. [Whether small doses of the sulphate of copper, joined with opium, would prove as useful in these cases as they were found by Dr. Elliotson (*Med. Chir. Trans.*, vol. xiii., p. 451, &c.) to be in chronic diarrhœa, future experience must determine: they should not be given on an empty stomach, as they would be likely to produce vomiting; but after breakfast. The smallest dose is a quarter of a grain; the largest, three grains.]

A like beneficial effect, however, has been derived from uniting the mineral acids with laudanum. The sulphuric, though the pleasantest to the taste, is more apt to irritate the bowels than the nitric. But the best mode of giving the latter, is by combining it with muriatic acid in the proportion of two thirds of the former to one of the latter, imitating hereby the chrysulea of Van Helmont, or the aqua regia of later chymists, the nitro-muriatic acid of the present day, in doses of two drops of the nitric, one of the muriatic, and ten minims of laudanum, intermixed with infusion of roses or that of the more powerful astringents, logwood, catechu, and gum kino. I have employed this medicine with peculiar advantage, not only in dysenteric, but in many other loosenesses and hemorrhages of the bowels, increasing the proportion of the acid or the laudanum as the urgency of the symptoms requires.*

When, however, the thirst is considerable, and acidulous drinks are called for, we may for this purpose use the sulphuric acid as the most grateful; though, in this case, the citric acid will usually be preferred, and the patient may be allowed to exercise his choice. Yet the one or the other of the above compounds should be continued, without any alteration in consequence of such a beverage.†

Since the second edition of this work, the medical world has been favoured with the opinion and practice of Dr. Baillie, in a printed but unpublished volume of his writings. And if there be individuals who object to the practice of Sydenham on account of its defective energy, they will have infinitely more reason to accuse this eminent physician of tameness. He recommends bleeding, indeed, as what is *frequently* of service, but local alone and by leeches; as cathartics, "mild purgative medicines, of which," says he, "I think castor-oil upon the whole the best;" and opiates and astringents to be delayed till "natural fluid motions" have been obtained.—(*Lectures and Observations on Medicine*, 1825.) Never was man more suspicious of the powers of medicine, or more entitled to the character of an expectant physician, than this eminent pathologist.

As the disease declines, there will often be found a very considerable degree of debility, and a chronic diarrhœa, with occasional discharges of blood, from the excoriated state of many of the minute bloodvessels of the mucous membrane of the intestines, or perhaps from a simple relaxation of the mouths of the capillaries. And in this situation, and especially where the disease has assumed a highly malignant character, many of the bitters of the Materia Medica, as the cinchona, columbo, simarouba, or extract of chamomile; and, perhaps, the *Nerium antidysentericum* of Linnæus may be resorted to, in connexion with acids, with great advantage. They have, indeed, occasionally been given from the first; and in a few very slight cases and very infirm constitutions, the practice may have succeeded; but as a general rule it is highly rash, and has rarely been tried without repentance.

In conjunction with this process, the very great tenderness of the interior of the larger intestines, from erosion or abrasion, will often, for a long time, demand peculiar local attention; and demulcent or bland oleaginous injections, as the infusion or oil of linseed, or olive-oil with a little wax and soap dissolved in it, together with a grain or two of opium if there should be much pain (the whole not to exceed three or four ounces in quantity), will often be found of great assistance.

Opium alone, in the form of a small pill or suppository, as recommended by many practitioners, will be generally found too harsh; and, where there is much tenesmus, it will be im-

* See likewise Th. Hope's Obs. on the powerful Effects of a Mixture of Nitrous Acid and Opium in curing Dysentery, Cholera, and Diarrhœa.—Edin. Med. and Surg. Journ., No. lxxxviii., p. 35.

† Many of the eminent physicians in different parts of the United States have recommended active antiphlogistic means in the treatment of dysentery: these embrace bleeding, mercurials, the saline cathartics, and the milder aperients. As the hepatic system is sometimes deranged in this disease, emetics, and particularly ipecacuanha combined with antimony, have been used by some to unlock the biliary secretions: blisters are employed by many practitioners, who apply them early, and the compound powder of ipecac. and opium (Dover's powder) is prescribed very generally. When dysentery exists as an epidemic, the depletory method of treatment must be pursued with great care; the physician ever regarding the rapid manner in which the powers of life are prostrated and destroyed by this typhoid condition of the system.

Prof. Geddings, of Baltimore, has recently published some remarks on the use of nux vomica in dysentery. From some experience with this drug, Dr. G. considers it as a useful adjuvant, to be used after suitable depletion, and especially when the disease is verging to a chronic form.—See N. A. Archives of Med. and Surg. Science, Baltimore, vol. i., p. 128.—D

possible to retain it. The only mode in which I have found it useful in this way is to rub it into an impalpable pulp with a little of the oil or butter of the cocoanut, and to mould it into small pastils of a sufficient consistency to bear the touch.

In long-protracted and chronic cases, lime-water, drunk freely, has occasionally also proved useful. The coat of the intestinal canal is here, however, sometimes very considerably thickened and indurated. And in such cases, the best remedy we can have recourse to is mercury.

The liberal and experimental practice pursued at the Dublin and various other hospitals in Ireland, during the late severe attacks of epidemic dysentery, and its general though often discrepant effects, may be appealed to in confirmation of the mode of treatment thus far laid down.

Such was the fatal ravage of the disease, that no one plan, hitherto devised, offered more than a very unsatisfactory success;—and hence almost every plan was tried in its turn.

From the treatment by mercury much was at first expected; and in many cases it seems to have been of use; but it "did not succeed," says Dr. Cheyne, "so well as I expected. Calomel, tried in every proportion and distance of time, often failed with me and my colleagues." —(*Report*, &c., p. 41.) And he adds shortly afterward, "Mercury could not be depended upon, and did not relieve in numerous instances where the mouth was affected; and sometimes seemed to increase the disease."—(Id., p. 45.) And even where the symptoms distinctly pointed out a morbid organization of the liver, the result of this treatment was unsatisfactory. "Mercurial frictions," says Dr. Cheyne, "were tried in all the forms over the region of the liver; but the advantages were not so extensively beneficial as I had reason to suppose, from finding that in every dissection the liver was in its structure more or less destroyed."—(Id., p. 89.)

Venesection and opium seem to have been more beneficial. "The lancet," he further adds, "has repeatedly afforded great temporary relief where ulceration seemed to have taken place; and the relief proved permanent from blisters, mild aperients, and anodynes. Where the lancet was not allowable, leeches were also highly useful."—(Id., p. 47.) Free venesection, we are told in another place, often procured a large feculent stool, where even purgatives failed. In conjunction with a blister, it often removed even the alarming symptom of dyspnœa when timely applied.—(Id., p. 26.)

Dr. Cheyne's sheet-anchor seems to have been opium, and to this he shows as strong an attachment as Sydenham, who only preferred the liquid to the solid form of this medicine, as he expressly tells us, on account of its more easy sub-action. Dr. Cheyne, however, carried his practice here, as well as in bleeding, to a considerably larger range, at least in severe and alarming cases. "The mercurials," says he (p. 44), "with opium, sometimes seemed to answer: but in future I should chiefly depend upon opiates in doses of four or five grains, as this seemed chiefly to arrest the progress of inflammation, diminished agony, and sometimes proved of permanent benefit."

In less violent assaults, he at length fell back still more fully into the practice of former times. "In the middle stages," he tells us, "I preferred to the treatment of mercurials, *the old proceeding*; venesection, purgatives (chiefly the saline), bath in the evening, diaphoretic at night. This was frequently successful in an early stage." The blood drawn on the first use of the lancet, was from thirty to forty ounces or more; which was repeated as often as necessary. With the saline purgative was often intermixed emetic tartar, to act on the stomach as well as on the bowels; and to these were added, in more violent cases, emollient injections, and, as already observed, blistering.

Castor-oil, so highly prized by many writers, rarely acted kindly, and very frequently aggravated the tormina and tenesmus. It succeeded best when united with opium.

Generally speaking, injections did not answer so well as was expected. The most successful were the terebinthinate clysters—the Venice turpentine of Sydenham being merely exchanged for the oil of turpentine or the balsam of copaiva. The local action was hereby frequently changed and meliorated. And even the griping property of castor-oil was softened, instead of augmented, by combining it with the rectified oil of turpentine.

The other kinds of injections chiefly employed, were diluted solutions of nitrate of silver and acetate of lead: the last united with opium. This combination was in high repute, on account of its decided success in various cases. Dr. Barker has since improved upon the principle, by giving to the joint materials the form of pills; under which modification it seems to have been still more effectual.

The ordinary astringents, in addition to the above, were, the chalk mixture, or infusion of catechu combined with laudanum.

In protracted cases, the medicines chiefly had recourse to were Dover's powder, small doses of ipecacuanha, and calomel. [The generality of army surgeons consider small doses of ipecacuanha serviceable. The utility of this medicine, and of small doses of hydrarg. cum cretâ, has been noticed by Dr. Bright.—(See *Bright's Reports*, p. 176, 4to., Lond., 1827.)] The treatment, where the disease ran into a chronic form, we shall notice presently.

[Dr. O'Beirne has related several cases in proof of the great efficacy of fomenting the abdomen with an infusion of tobacco, made by pouring two quarts of boiling water on two ounces of Virginian leaf-tobacco, and allowing it to stand for twenty minutes before use. Tobacco clysters, owing to the irritable state of the rectum, were not found to answer. Dr. O'Beirne usually lets the use of the fomentation be preceded by a mild purgative, like castor-oil; and, indeed, he lays it down as a good general rule, that purgatives should be continued with the fomentation, until perfectly natural and feculent discharges be permanently established. The fomentations were sometimes repeated more

than once in the day, and generally not discontinued, until some disturbance of the stomach and head had been experienced.—(*Trans. of King's and Queen's College of Physicians*, vol. iv., p. 386, &c.)]

SPECIES II.
DYSENTERIA CHRONICA.
CHRONIC DYSENTERY.

STOOLS FREQUENT, LOOSE, AND FECAL: OFTEN WITH LARGE DEJECTIONS OF PURE OR GRUMOUS BLOOD, AND ESPECIALLY WHERE THERE IS SEVERE TENESMUS; MORBID PROGRESS SLOW AND INSIDIOUS; MOSTLY WITH HECTIC FEVER.

The genuine symptoms noticed under the preceding species, are for the most part rapid and violent: and, when they have run through their course, if the constitution generally, or the alvine organs more particularly, be reduced to a state of extreme debility and relaxation, the disease, instead of yielding to a return of health, is extremely apt to pass into the present species of dysentery.

But it not unfrequently happens, that the causes of the disease are feeble and slow, though persevering in their mode of action; or that the organs on which they operate locally are already in an infirm or undermined state, so as to possess scarcely energy enough to evince any vehemence of excitement; and in either of such cases, chronic dysentery is produced without the intervention of acute, and becomes a primary malady.

The causes are chiefly a repeated exposure to a cold, damp air, and especially in warm weather, by which the perspiration of the skin becomes frequently and suddenly suppressed; and an habitual irritation of the alvine canal, by a daily indulgence in highly stimulant food, and particularly spirits.

In this speciest he inflammatory action spreads insidiously from one organ to another, till all the viscera subservient to the digestive process are implicated in a common chain of disease; and especially the liver, which is usually, indeed, in a state of great irritability and weakness from the first; as are also the mesenteric glands.

Hence, the symptoms must vary according to the progress of the disease, and the extent of the structural injury, from a simple relaxed state of the bowels, producing diarrhœa, uniformly accompanied with a greater or less degree of tenesmus, to a permanent ulceration, pouring forth purulent matter, or a more compound colluvies, sometimes watery like the washings of raw flesh, sometimes coagulated like dirty cream, and sometimes black and tenacious as pitch; and in most cases intolerably fetid.—(*O'Brien on Dysentery of Ireland*, p. 58, Dublin, 1822.) Occasionally, indeed, there is a dejection of sordid pus in considerable abundance, in consequence of the bursting of an abscess that has been long forming in the liver or some other organ, and has discharged its contents immediately or intermediately into the intestinal canal.—(*R. W. Bampfield on Tropical Dysentery*, &c., p. 3, Lond., 8vo., 1819.) And we may hence see abundant cause for those colliquative sweats, dry, distressing cough, and other symptoms of hectic fever, which so frequently accompany this form of dysentery.

Chronic dysentery may, therefore, in its simplest and mildest state, be regarded as a GLEET of the larger intestines, produced, as urethral gleet is, by a morbid relaxation of the mucous glands of the part affected, and accompanied with that sort of irritation which is the usual cause of increased secretion in debilitated organs.

If the irritation be of any considerable extent over the intestinal canal, the peristaltic action is often permanently excited, and we have then an obstinate and weakening diarrhœa, pain at the pit of the stomach, with loss of appetite, and other dyspeptic symptoms.

If the same irritation ramify, whether by sympathy or continuous action, to the liver, we often find this organ also stimulated to a very considerable excess of secretion; when there is a frequent flow of bilious fluid from the rectum, sometimes nearly pure, but more generally depraved, and intermixed in its passage with other materials, constituting that variety of the disease which, by practitioners in the east, has been often denominated BILIOUS or HEPATIC FLUX.—(*Curtis on the Diseases of India.*)

Not unfrequently, however, the discharge from the rectum is pure or depraved blood, instead of bile; the relaxed and debilitated capillaries of the organs chiefly affected pouring forth this fluid in great abundance by anastomosis, or a gangrenous erosion of the tunics of larger vessels. This case is correctly denominated BLOODY FLUX.

In the late epidemic dysentery in Ireland, Dr. O'Brien included all those cases under the present species which ran on to a longer period than six weeks, and were accompanied with little or no fever. The most numerous sufferers were the aged and infirm, who had previously laboured under diseases of the liver, or some other abdominal organ.

From the extensive range of the morbid action, the impoverished state of the constitution, and, consequently, its difficulty of rallying, it is not often that a patient recovers from this form of the disease, when it has once passed from its mild or simple stage into a severer or more complicated course; and, on this account, Dr. L. Frank has asserted that it is essentially more fatal than the acute species.

Post-obit dissections have given nearly the same appearances as we have already noticed; there is abrasion or ulceration of the mucous membrane of the intestines;—the colon is very generally found thickened and contracted through its whole extent, but particularly in its lower flexure. The smaller intestines are rarely traced in a state of ulceration; but patches of a deep-red colour are found in scattered plots, and especially on the ileum. The liver is not always affected in its structure, though more frequently than in the acute form. the gall-bladder is usually distended with deep-brown or

dark-yellow bile, evincing a paresis or obstruction in the cystic duct.

The THERAPEUTIC INTENTIONS are here to change the nature of the morbid and irritable action; to diminish the exhausting discharges; and to give tone to the languid and impoverished frame.

For the first purpose, the most effectual medicine is calomel, either alone or intermixed with opium. "If, in treating of the *acute* form of flux," says Dr. Ballingall, "I have refrained from an indiscriminate, and, as I conceive, unmerited commendation of this powerful medicine, it is only in hopes of being able to urge its employment with double force in the form of disease now under consideration; and to recommend an implicit reliance on it in the chronic form of flux; to ascribe to it an almost unlimited power in the disease; and to express an opinion that it will seldom disappoint our most sanguine hopes." Its effects in India, where torpitude and congestion are more frequent and more excessive than in cooler climates, seem to give full sanction to this unqualified recommendation, and authorize its employment in large doses. In our own country, though very far from affording universal success, it is of pre-eminent importance; but, as it requires a long perseverance in its use, it will be found an error to load the system with it suddenly. In Ireland it was most beneficially employed in the form of the blue-pill, combined with opium and a minute appendage of emetic tartar.*

Here, too, the terebinthinate preparations may frequently be had recourse to with some confidence; as may, also, for the same purpose of improving the local action, the essential oil of turpentine and the balsam of copayva. As an aperient, oil of castor may generally be employed with less excitement of griping than in the acute form: but, whatever laxatives are had recourse to, they should always be of as mild a character as possible; and hence rhubarb in combination with small doses of calomel or Epsom salts, is often preferable to castor-oil.

By keeping the bowels free from irritation in this gentle manner, we indirectly check the morbid discharges of whatever kind by which the disease is so peculiarly distinguished. And, where more direct and powerful means are necessary, the compound chalk mixture with opium, various preparations of kino or catechu, or the acetate of lead, in solution or pills, or small doses of the sulphate of copper, joined with opium, may be tried.†

The diet should be bland and nutritious, composed chiefly of milk, as recommended by Sir John Pringle, or of vegetable mucilages, as rice, arrow-root, sago, and salep. And, as soon as the local irritation has manifestly subsided, a more cordial and tonic plan should be entered upon; animal food be allowed; the warmer bitters and metallic corroborants be prescribed, as cascarilla, columbo, sulphate of zinc; and such exercise and change of air as may best comport with the patient's constitution and station in life. Dr. O'Brien judiciously recommends him to try a warmer climate if his home be the British Isles, and a colder if he be a resident between the tropics. In all situations, he must be especially careful to avoid sudden changes of temperature, and particularly a cold, damp atmosphere, and maintain a healthy excitement on the skin by flannel socks worn on the feet, and flannel swathing around the body.*

GENUS XI.

BUCNEMIA.

TUMID LEG.

TENSE, DIFFUSE, INFLAMMATORY SWELLING OF A LOWER EXTREMITY; USUALLY COMMENCING AT THE INGUINAL GLANDS, AND EXTENDING IN THE COURSE OF THE LYMPHATICS.

This genus is new to nosological classifications: but it is necessary, in order to include two diseases which have hitherto been regarded by most writers as totally unconnected, and treated of very remotely from each other; but which, though occurring under very different circumstances, are marked by the same proximate cause, in most instances affect the same organs, and demand the same local treatment. They consist of the following species:—

1. Bucnemia Sparganosis. Puerperal tumid leg.
2. ——— Tropica. Tumid leg of hot climates.

As the present genus is new, it has been necessary to distinguish it by a new name; and,

* In the Peninsula mercury was found by Sir James M'Grigor to be injurious, except when the liver was diseased.—See Med. Chir. Trans.—Ed.

† A valuable paper on Chronic Dysentery, by Dr. S. K. Mitchell, is published in the Am. Journ. of Med., &c., vol. ii., p. 323. From numerous cases occurring in his own practice and that of his friends, Dr. M. feels confident that "most cases of chronic dysentery are remediable by the exclusive use of mucilage without sugar, and of the blue-pill given in from three to five grain doses, not more frequently than once in twenty-four hours, nor less frequently than once in forty-eight hours. Some cases, of course, require depletion by venesection, &c., and some occasionally demand the use of means to unload the intestines; but commonly the mucilaginous diet and blue-pill afford almost immediate relief, and soon effect a cure." The same treatment has been pursued with success by other practitioners.—D.

* If there be any tenderness about the abdomen, Dr. Elliotson recommends leeches to be put on the anus and front of the belly, for the alleviation of the tenesmus, which may then depend upon inflammation. When this symptom arises merely from irritation, he approves of an injection of forty or fifty drops of laudanum, mixed with not more than four ounces of a solution of starch, or with what Sir James M'Grigor found afford great relief in the Peninsula, a solution of the acetate of lead. Dr. Elliotson has not found it necessary to prescribe mercury in the kind of chronic dysentery met with in England; but he speaks favourably of the plan of applying straps of adhesive plaster round the trunk, and a flannel bandage over them.—See Lect. at the Lond. Univ., as published in Med. Gaz. for 1833, p. 558.—Ed.

on this account, the author has made choice of that of *Bucnemia*, from βου, a Greek augment, probably derived from the Hebrew בע or בעה "to swell, augment, or tumefy," a particle common to the medical vocabulary; and the Greek noun κνήμη, "crus," or "the leg," literally, therefore, "bulky or tumid leg."

SPECIES I.

BUCNEMIA SPARGANOSIS.

PUERPERAL TUMID LEG.

THE TUMID LIMB PALE, GLABROUS, EQUABLE, ELASTIC, ACUTELY TENDER; EXHIBITING TO THE TOUCH A FEELING OF NUMEROUS IRREGULAR PROMINENCES UNDER THE SKIN; FEVER A HECTIC; OCCURRING CHIEFLY DURING THE SECOND OR THIRD WEEK FROM CHILDBIRTH.

THE tumid leg of childbirth has mostly been contemplated as a very different affection from that of hot climates, and has rarely been treated of in connexion with it. In the present author's first edition of his Nosology, the ordinary arrangement was so far adopted, that the two species were placed remotely from each other, though a distinction between elephantiasis and the tumid leg was strongly enforced.

The tumid leg of lying-in women has been described by different authors under a variety of names, as *phlegmasia dolens*, *phlegmasia lactea*, *ecchymoma lymphatica*, and by Dr. Cullen as *anasarca serosa*; few of which express the real nature of the affection, and some of them a source obviously erroneous.

By Dioscorides it was denominated sparganosis, from σπαργάω, "to tumefy and distend:" *tumeo et distentus sum*, as rendered by Scapula; and, as the term is sufficiently expressive, it has been preferred on the present occasion. By most writers, till within the last twenty or thirty years, the swelling has been ascribed either to a suppression of the lochia, or a redundance of milk, and a morbid deposition in consequence of such redundance. Mauriceau regarded it as a metastasis of the lochia, and Puzos as a metastasis of the milk; whence the French practitioners call it, to the present day, *depôt laiteux*, or *lait répandu*; and the Germans *milchstreichen*. A minuter attention to the subject, however, has sufficiently shown that this complaint has seldom any connexion with the milk, perhaps never. It has occurred where the breasts have been destitute of milk, and where they have overflowed; where suckling has been relinquished, and where it has been continued. It is not long since that I was consulted by a young woman labouring under it, who was suckling her infant, without any complaint of the breast whatever.

It is as little influenced by the state of the lochia as by that of the milk. It attacks women of all ranks and of all habits, the healthy and the diseased, the lean and the corpulent, the sedentary and the active, the young* and the middle-aged. It also occurs in all situations, and has never perhaps been known to appear in any other part of the body than the lower extremities.

My esteemed friends Dr. Hosack and Dr. Francis, of New-York, have, however, ingeniously contended that it has also been found in the upper* as well as in the lower limbs, and in males as well as in females; and they especially appeal to one case communicated to them by Dr. Heermans of Ontario, which, could it be relied on, would go far to settle the question; but, as it appears to me that this, like various similar cases that have occurred to the present author, was an instance of erratic or metastatic rheumatism rather than sparganosis, we are not at present authorized to deviate from the ordinary character assigned to the disease, or to generalize it in the manner which this more extended view of its occurrence would demand of us. Other local affections, indeed, make an approach to it, of which Dr. Denmark has described one that occurred in a male, which, however, he prudently avoids calling a phlegmasia dolens, contenting himself with saying that it resembled it; while Dr. Davis, as we shall have to observe presently, seems to have mistaken for this complaint an inflammation of one of the larger veins in the pelvis or its vicinity.

[The editor is happy in having here an opportunity to remark, that Dr. Davis only attempted to show the grounds he had for thinking that phlegmasia dolens was essentially connected with inflammation and obstruction of the iliac veins; and he has undoubtedly proved by dissection, that, in some particular instances, corresponding, as he judged, though not as our author believed, to the latter disease, those veins were inflamed and obstructed. Whether such affection of the veins exists in all or most cases of phlegmasia dolens, can only be determined by further pathological investigations.† In the meanwhile it may be right to mention, that Dr. Davis's view has already received material support from three cases recorded by M. Velpeau, in all of which the sacro-iliac symphysis on the diseased side was more or less affected; accompanied with purulent effusions in the peritoneum, and about the genital organs; and a mixture of pus and coagulated blood in the veins of the limb, with evident traces of inflammation of their coats in two of the cases. It is true, that the alteration of the sacro-iliac symphysis

* A case of this kind, occurring in a young woman, is mentioned by Hazeltine.—(See Comm. to the Mass. Med. Soc., vol. iii., Boston, 1819.)—D.

* In Mr. Fraser's case, the left thigh and *arm* were considerably larger than the right.—See Edin. Med. Journ., No. xc., p. 17.—ED.

† In the case reported by Mr. Fraser, no traces of disease were found in the iliac vein; and he is inclined to regard phlegmasia dolens as a modification of diffuse inflammation of the cellular membrane, as described by Dr. Duncan. On the other hand, Dr. Lee proposes to substitute the term *crural phlebitis* for *phlegmasia dolens*; "as it has been demonstrated by the researches of recent pathologists, that the swelling of the affected limbs, and all the other local and constitutional symptoms of this affection, *invariably* depend on inflammation of the iliac and femoral veins."—Cyclop of Pract. Med., art. PHLEGMASIA DOLENS.—ED.

is regarded by Velpeau as the occasion of all the other disorder, and so far he differs from Dr. Davis; yet the fact of the veins being inflamed and obstructed, in the examples alluded to, is certainly an important coincidence with what was noticed in the cases adduced by Dr. Davis.*

Neither does it appear to the editor that satisfactory proof has been given, that phlegmasia dolens is exclusively a disease of the female sex. He visited, in the military hospital at Cambray, in 1816, a soldier who was under the care of Dr. Booty, and was afflicted with a swelling of one of the lower extremities, which that gentleman, an army practitioner of considerable merit, confessed that he knew not how to discriminate from phlegmasia dolens. Had the editor had no difficulty in joining the author in the supposition, that any eminent physician could have mistaken rheumatism for phlegmasia dolens, he should yet have had to overlook the foregoing facts, as well as the interesting case of inflammation of the iliac and femoral vein, related by Dr. C. Forbes.—(*Med. Chir. Trans.*, vol. xiii., p. 296.) "The morbid appearances observed in this instance," he says, "were very similar to those which have been described by Dr. Davis. Had the subject of the disease been a woman in the puerperal state, would it not," he asks, "have been considered phlegmasia dolens?" This example, be it observed, is an additional corroboration of the statement respecting the condition of the veins. A peculiar swelling of the lower extremity coming on after fever, and corresponding very much in its character and progress to phlegmasia dolens, was lately described by Dr. Tweedie, who points out its differences from common œdema of the limb, and represents it as an inflammation of the cellular tissue.]†

In about twelve or fourteen days after delivery, according to the common course of the disease, the patient complains of pain in the groin of one side, accompanied with the general train of pyrectic symptoms, but without the precursive shivering. The part affected soon becomes swelled and distended, the swelling usually extending to the labia pudendi of the same side, and down the inside of the thigh to the leg and foot; in a day or two, the limb is double its natural size, is hot, exquisitely tender, and moved with great difficulty. It has not, however, the ordinary external signs of inflammation, but is hard, smooth, glabrous, pale, and equable, except where the conglobate glands are situate, which are corded and knotty, as in the groin, the ham, and the back and fleshy part of the leg. There is occasionally an uneasiness in the loins, and in the region of the pubes on the same side. The swelling has sometimes appeared as early as twenty-four hours after delivery, and sometimes not till five weeks afterward. The accompanying fever, which is of a hectic form, usually declines about the fourteenth or twenty-first day, but in some cases runs on for six or eight weeks, and the patient becomes greatly emaciated. The first appearance of improvement takes place about the groin, where the disease commenced, the pain and tumour gradually subsiding in this quarter, and the amendment spreading in a continuous line.* Sometimes, though rarely, both sides are affected simultaneously, and, in a few instances, the sound leg has exhibited something, though a less degree, of the same complaint, as the diseased leg has improved. The improvement is very slow; and, in many cases, the affected limb continues weak, and with morbid enlargement through life.

[Velpeau's opinion, that the origin of the disease is connected with an alteration of the sacro-iliac symphysis, has been already noticed.] Dr. Whyte, M. Caspar, and Mr. Trye, concur in deriving the disease from some affection of

* In January, 1823, several cases and dissections were published by Bouillaud, in which the crural veins were found obliterated in women who had had a swelling of the lower extremity after delivery. Although these cases were printed four months before Dr. Davis's paper was read, "it does not admit of dispute," says Dr. Lee, "that Dr. Davis was the first who proved by dissection, that phlegmasia dolens depended on inflammation of the iliac and femoral veins."—(See Cyclop. of Pract. Med., art. Phlegmasia dolens.) The numerous cases and dissections of which Dr. Lee has since published the histories in the Med. and Chir. Trans., and in a recent work on the "Pathology and Treatment of some of the most important Diseases of Women," offer a still more complete explanation of the subject; demonstrating that if inflammation be excited in the uterine branches of the hypogastric veins, it may spread from them to the iliac and femoral veins, and by the morbid changes induced in them, give rise to all the usual symptoms.—Ed.

† Edin. Med. Journ., No. xcvii., p. 258. In the spring of 1833, a case of chronic dysentery in a man came under the observation of Dr. Macann, in which phlegmasia dolens took place before death. On dissection, the common iliac, the external iliac, and femoral veins of the left side, were found to be completely obstructed, and their coats extensively disorganized by inflammation. The preparation is in the possession of Dr. Lee, to whom it was given by Dr. Forbes. In the male sex, the disease may commence either in the hemorrhoidal, vesical, or other branches of the internal iliac veins, in consequence of inflammation, or organic changes of structure in one or more of the pelvic viscera. It arises, however, much more frequently from inflammation, excited in the superficial veins of the leg, and extending upwards to the great venous trunks of the thigh and pelvis, as exemplified in several examples collected by Dr. R. Lee, from the practice of Sir Astley Cooper and others. Phlegmasia dolens seems to the editor, then, not to be precisely synonymous with crural phlebitis but an occasional effect of it.—Ed.

* Dr. Mann, of Boston, states the following curious fact in regard to bucnemia. He was called in consultation to a case of this disorder, where the attending physician, supposing the swelling contained some fluid which required to be evacuated, had made an incision through the skin and adipose substance of the enlarged limb, in order to discharge its contents: "herein," adds Dr. M., "he was not only disappointed, but, to his mortification, the incised part became gangrenous: a sphacelus of the whole limb soon followed, which terminated fatally in about ten days after the operation."—Comm. Mass. Med. Soc., vol. ii.—D

the lymphatics of the distended side. Dr. Whyte refers it to an extravasation from the lymphatic vessels ruptured by the pressure of the child's head: Professor Caspar, to a mixed inflammation of the absorbents and cellular membrane (*Comm. de Phlegmasia dolente*, 8vo., Halle, 1819); and Mr. Trye, to inflammation of the lymphatic glands. Dr. Ferriar ascribes it to inflammation of the side affected generally; and Dr. Hull to a joint inflammation of the muscles, cellular membrane, and inferior surface of the cutis seated in the affected part, and an effusion of coagulable lymph, the large blood-vessels, nerves, lymphatic glands, and glands imbedded in them at times participating in the inflammatory action. The last, if not the real cause, would be sufficiently plausible if the inflammation be supposed to commence in the lymphatics, instead of being merely extended to them. As it is, Dr. Hull's hypothesis has been adopted and enlarged by Dr. Hosack, who regards the complaint as an inflammatory disease, "not merely affecting the limb, but the whole system," commencing, not in the groin or pelvis, but about the calf of the leg; not limited to the lymphatics or even to females, but common to both sexes, and to every part of the affected limb; sometimes appearing in both limbs at the same time; and where depletion is not actively employed, occasionally, like gout and rheumatism, transferred from one limb to another: produced usually by a suppression of the natural excretions, exposure to cold, stimulating drinks, and other means of excitement. To the disease thus described Dr. Hosack has given the name of CRURITIS (*Obs. on Cruritis, or Phlegmasia Dolens*, 8vo., New-York, 1822), not quite classically formed; as partaking of two distinct tongues, and not quite applicable to an affection so variable as to seats, and so migratory even when it once shows itself. The disease is ably described, and followed up with the hand of a master, but it is not, as it appears to me, the disease before us, and belongs rather to our next genus.

Mr. Davis has probably thought the same; for he has entirely stripped the tumid leg of the unrestrained license of attack allowed it by Dr. Hosack, and of its migratory spirit afterward: has restrained it to the female sex, and to the immediate neighbourhood of the pelvis. "The proximate cause," says he, "of the disease called phlegmasia dolens, is a violent inflammation of one or more of the principal veins within, and in the neighbourhood of the pelvis, producing an increased thickness of their coats, the formation of false membranes in their internal surface, a gradual coagulation of their contents; and occasionally a destructive suppuration of their whole texture: in consequence of which, the diameters of the cavities of these important vessels become so gradually diminished, sometimes so totally obstructed, as to be rendered mechanically incompetent to carry forward into their corresponding trunks the venous blood brought to them by their inferior contributing branches."—(*Med. Chir. Trans.*, vol. xii., part ii., p. 3.)

Here again we have a very accurate description of a disease by no means uncommon, which, moreover, is supported by a variety of cases, most of which have unfortunately a history of their dissections appended to them, containing a clear manifestation of the nature of this very fatal inflammation, and for the most part of the formation of a false membrane within the affected vessel. But if the present author have succeeded in truly delineating the disease before us, either in his specific definition or his diagnostic description, it must be obvious to every reader who will compare them with the appearances laid down by Dr. Davis, that two different inflammations are referred to in the respective statements, the symptoms of which cannot possibly co-exist; that the very fatality of that described by Dr. Davis is of itself a sufficient proof of a clear and very striking distinction:* and that, though both occasionally take place soon after childbirth, the enlargement he has treated of is far less a phlegmasia dolens than a particular variety of venous inflammation, the PHLEBITIS of several authors: for a striking example of which, proceeding from an obscure cause, and extending over the arm instead of over the leg, I may refer to Dr. Duncan's interesting case, in the Transactions of the Edinburgh Medico-Chirurgical Society.† It gives us the same general swelling over the entire limb; rather phlegmonous than erythematous; but, to adopt the author's own simile, still more resembling an anasarcous affection, yet without pitting. It gives, moreover, the same fatal result; and, on examination after death, develops the same thickening of the coats of the vein, and the same obstruction from morbid secretions. And to show still further how little foundation there is for this doctrine, we have in the very next article in the same volume, composed by the same indefatigable author, various cases of diffuse inflammation of the cellular membrane without any affection of the neighbouring veins, so closely approaching the general character of the sparganosis before us, that he finds a difficulty in calling them by any other name, and appears greatly inclined to adopt Dr. Hull's hypothesis of the disease.—(*Trans. Medico-Chir. Soc. Edin.*, vol. i., p. 582.)

There is apparently as little reason for the hypothesis of Dr. Denman, who, while regarding it as an inflammation of the lymphatics, refers the inflammation to an absorption of some acrimonious matter secreted by the uterus, for the

* As Dr. Davis's main object was to record the appearances on dissection, the circumstance of his having brought forward only fatal cases must not be received as a proof of the general or common fatality of the disease.—ED.

† Case of Inflammation of the Cephalic Vein, which terminated fatally, vol. i., p. 439. The swelling, named by Dr Good *bucnemia sparganosis*, and more commonly by other writers *phlegmasia dolens*, is to be regarded as an occasional effect of the obstruction and disorganization of the femoral and iliac veins by phlebitis. On this ground the editor cannot regard the proposed name of crural phlebitis, as a substitute for phlegmasia dolens, as correct.—ED.

disease has occurred where there has been no more morbid action of the uterus than of the mammæ; and all the secretions have proceeded healthily and in their proper quantity.*

The cure is to be attempted first by a free application of leeches all along the course of the limb, poppyhead fomentations, or, what is better, a swathe of flannel wrung out in hot water applied over the whole extent of the limb, surrounded by a loose bandage of sheeting. To this plan should be added purgatives of considerable activity, and where the irritation is considerable, free doses of Dover's powder. General bleeding is rarely, though sometimes necessary. As soon as the inflammatory symptoms have a little subsided, local stimulants may be had recourse to, so as to excite the torpid absorbents to increased action: of which the most useful in the author's hands has been the liniment of ammonia with laudanum.

The laudanum, on a cursory view, may seem to add to the vascular torpor; but it tends to take off the pain and soreness that still remain, and thus enables the tranquillized vessels the more easily to recover their tone. Yet whatever application of this kind is employed, it should be accompanied with gentle friction, continued for half an hour or more, if the limb is able to bear it; for the friction itself is of essential service, and tends, perhaps, even more than any other local stimulant, to restore the limb to a healthy action.

Mr. Trye advises, for the same purpose, the use of mercurial ointment; and others that of small doses of calomel. But neither have proved decidedly useful; while in some instances of great debility, they have evidently produced mischief. The chronic weakness is to be removed by a continuance of the friction, bathing with sea-water, or, which is much better, bathing in the sea itself, an elastic flannel bandage, horse-exercise, pure air, and, if necessary, general tonics and astringents. [Dr. Lee has not seen any benefit produced by mercurial and iodine applications; and, at the commencement, he relies chiefly on the free abstraction of blood by leeches applied above and below Poupart's ligament, in the direction of the femoral and iliac veins. In a case recorded by Dr. Sims, great relief was derived from puncturing the swelling in different places with a needle.—(*Dr. R. Lee's art.* Phlegmasia dolens, *in Cyclop. of Pract. Med.*)]

SPECIES II.

BUCNEMIA TROPICA.

TUMID LEG OF HOT CLIMATES.

THE TUMID LIMB HARD, LIVID, AND ENORMOUSLY MISSHAPEN; SKIN AT FIRST GLABROUS, AFTERWARD THICK, SCALY, AND WARTY; SUCCESSIVELY BULGING AND INDENTED: OCCURRING CHIEFLY IN TROPICAL CLIMATES.

This species is intended to comprise that singular disease, known in the West Indies, and generally over Europe, by the name of *Barbadoes leg*, from its being indigenous to the Island of Barbadoes. Yet it is not in Barbadoes alone that it makes its appearance; for it is of high antiquity, as well as of very wide range, in hot, and especially in tropical climates; and constitutes the genuine DAL-FIL دار الفيل or elephant-leg of the Arabians, being so denominated from its livid, tumefied, scaly, misshapen appearance. As the Arabic dal or dal-fil دار الفيل is literally elephantiasis or elephant-leg, and as the Greeks distinguished another and very different disease by the name of elephantiasis, the Greek translators of the Arabian writers were very generally betrayed, from the unity of the name, into a confusion of the two disorders, as we shall have occasion still further to observe when treating of proper ELEPHANTIASIS under the fourth order of the present class: and the confusion has, in a considerable degree, descended to our own times, insomuch that many writers of the present day continue to jumble the elephantiasis, or elephant-*leg*, of the Arabians, with the elephantiasis, or elephant-*skin*, of the Greeks, and to describe them as a common affection, though

* The views of American writers on the nature of bucnemia sparganosis differ as much as those of European authors. In a paper of some extent (N. A. Med. and Surg. Journal, vol. iv.), Dr. Huston considers the disease "as consisting in a complete engorgement of the whole lymphatic system of the affected limb, produced by an inflamed condition of the different conglobate glands, through which the chief lymphatic vessels have to pass, on their way from the affected part to the thoracic duct." Eberle (Practice of Med.) entertains the same belief. Dewees doubts the accuracy of the views of Davis in assuming the disease to be analogous to phlebitis (Practice of Physic). Dr. Jameson, of Baltimore, considers it "as but a variety of an extensive group of inflammations, the peculiar characteristic of which is, a tendency to the effusion of serum or watery fluid."—(Amer. Med. Recorder, vol. xv., p. 66.) Dr. Francis's paper (New-York Med. and Phys. Journal, vol. i.) mentions several instances of bucnemia, attended with peculiar circumstances; among others, an example of the disorder affecting a male subject; an instance of the transfer of the complaint from one limb to the other in the same lying-in female; another case also, in which the same female became affected with it in four successive labours, at each recurrence it attacked the same limb, the right; in another case, where bucnemia appeared in the arms. According to Dr. Beck, Ferriar was the first author who remarked that this disease might appear in the upper extremities, and Carus has mentioned instances of its occurrence there. Callister takes the same view of its seat, as existing sometimes in the upper limbs: the opinion of Dr. F., therefore, that other parts than the lower extremities may become its seat, has the concurrent testimony of several eminent men in its behalf; and very recently, Otto, in his Handbuch der Pathol. Anat., vol. i., has sanctioned the same belief.

American practitioners generally treat this disease with great activity, by bloodletting and other depletory means. Dr. Dewees has found it necessary to bleed six or seven times before the complaint yielded.—D.

no two complaints can be more unlike: the former being a mere local malady, produced accidentally, and confined to the individual who labours under it; and the latter a constitutional disease, in every quarter hereditary, and in most quarters contagious.

The Arabians, however, had the disease called elephant-skin, the elephantiasis of the Greeks, by themselves called juzam جزام, as well as the dal-fil, or elephant-leg, the disease before us. And, as the malady called leprosy, and by the Arabians beras برص, was supposed by many physicians, as well Arabian as Greek, to terminate frequently in juzam, or proper elephantiasis, the disease before us has occasionally also been confounded with leprosy as well as with elephant-skin, and all the three affections have been huddled together by many writers into one common disease. Even Dr. Schilling, a late practitioner of considerable merit at Surinam, has not escaped this last error; for he describes the tumid leg under the name of leprosy; confuses its earliest symptoms and appearance with those of the leprosy of the Greeks, and especially with those of the lepra or *lepriasis candida*, and then distinguishes elephantiasis, the disorder he professes to be the immediate subject of his pen, as a peculiar branch of leprosy, merely varied by its commencing in the feet, instead of in any other part of the body; and, carrying on the confusion, he next interprets the tumid leg, or disease before us, as a mere variety of elephantiasis.—(*G. G. Schillingii de Leprâ Commentationes*, 8vo., Lugd. Bat., 1776.)

For a distinct and more correct account of this species, we must turn to the writings of Dr. Hillary (*Works*, vol. i., p. 549, 4to. edit., 1799) and Dr. Hendy, who have judiciously separated it from both the leprosy and the elephantiasis of the Greek writers, and treated of it as an individual malady: the former under the name of "Barbadoes leg," and the latter under that of the "Glandular Disease of Barbadoes." It is singular, however, that Dr. Hendy should have adopted the erroneous idea, that the disease before us is not only endemial to Barbadoes, but that it is to be found nowhere else; and that patients who migrate from this island for a cure are almost sure to obtain one, unless in a chronic or inveterate stage of the disease, to whatever quarter they direct their course. It has been known immemorially in India, and is by the oriental writers, and even by Sir William Jones, justly distinguished from the *juzam*, which he tells us must not be confounded with the *dal-fil*, or swelled legs described by the Arabian physicians, and very common in that country. It is also indigenous to the Polynesian Isles, where it takes the name of yava-skin, as being supposed to originate from drinking the heating beverage called yava; and, like the gout among ourselves, is regarded in a sort of honourable light.*

The tropical bucnemia, like the puerperal, is occasioned by an effusion of coagulable lymph into the cellular membrane under the skin of the part affected, in consequence of inflammation of the lymphatics of the lower limb, and especially of the inguinal glands; the cause of which is at present quite unknown.

[The doctrine, that the disease essentially consists in an inflammation of the lymphatic vessels and glands, may be said now to be on the decline. In fact, we commonly see these organs inflamed, both in warm and cold climates, without any consequences resembling bucnemia tropica. Dr. Graves (*Trans. of the King's and Queen's College of Physicians*, vol. v., p. 65) notices various circumstances amounting very nearly to a complete refutation of the opinion. Thus, he particularly adverts to a passage in Dr. Hillary's work, from which it appears that the disease sometimes attacks the arm, scalp, ears, back part of the neck, the loins, &c. Enormous chronic growths of the integuments and cellular membrane sometimes affect the arm, penis, and scrotum, even in this country; the disease closely resembling the Barbadoes leg, and examples of which had been seen by Mr. Chevalier.—(See *Med. Chir. Trans.*, vol. ii., p. 71.) It is obvious, as Dr. Graves has remarked, that, in such parts, the swelling could not have arisen merely from glandular inflammation; and as, from various facts which he has brought forward, it is proved that inflammation of the skin and subjacent cellular tissue is in itself capable of producing a swelling, in all other respects similar to that of Barbadoes leg, he is inclined to think that a more accurate investigation of the subject would have induced Dr. Good to modify the opinion he has delivered on the subject.

As far as the point can be decided by a reference to cases very similar to the Barbadoes leg, which have occasionally taken place in Great Britain or Ireland, the editor certainly joins Dr. Graves in the belief, that the disease does not arise from, or essentially consist in, disease of the lymphatic glands or vessels. In the highly interesting example of an extraordinary enlargement of the right lower extremity, recorded by Mr. Chevalier, and which occurred in an English woman in this metropolis, no change in the absorbent glands could be detected after death, either at the groin or within the pelvis.—(Op. cit., vol. ii., p. 67.) In a very similar case, related by Dr. Graves, and which happened in a young man, twenty-five years of age, admitted into the Meath Hospital, "the swelling had commenced many years before his admission into the hospital, and had attained its enormous size gradually, and without the least pain or inflammation of the skin, the subjacent adipose tissue, or *inguinal glands*." Dr. Graves has no doubt, that, as in Chevalier's case, the tumefaction arose from an extraordinary growth of the skin and subjacent adipose

* Cases of bucnemia tropica have occurred also in natives of the United States who have never visited a tropical climate.—See Hosack's Med. Essays, vol. iii., p. 99.—D.

membrane, quite independently of inflammation.*

The diseases described by Mr. Chevalier and Dr. Graves, seem to the editor to correspond to the enormous growth of the scrotum, so common in Egypt and other warm countries, yet sometimes met with in France, this country, and other parts of Europe.† Dr. Graves is of opinion, that the example which he has published is entirely different both from phlegmasia dolens and the Barbadoes leg, which affections, he says, arise from inflammation. It certainly appears, that some extraordinary enlargements of the lower extremity have depended upon a chronic growth and thickening of the integuments and cellular tissue, no inflammation having occurred, at all events, until the disease was far advanced. Yet, in other instances, a similar alteration of the skin and cellular membrane has been preceded either by an attack like that of phlegmasia dolens, as happened in Mr. Chevalier's example, or by fever, and heat and redness of the skin, as illustrated in one curious modification of the disease, described by Dr. Graves, and, as it seems, by no means uncommon in Ireland, where it affects the arms, perhaps, more frequently than the legs.]

In the tumid leg of hot climates, the skin, instead of maintaining the paleness of the first species, very soon becomes suffused with a deep red or purple hue; while the saburral fluid that exudes from the cutaneous exhalants, concretes, as its finer parts fly off, into rough and sordid scales, and the skin itself becomes enormously thickened and coriaceous.

The effusion is usually preceded by a febrile paroxysm, induced by the glandular inflammation just noticed; and which, from the first, discovers a tendency to recur, though often at irregular periods, so as to resemble an erratic intermittent. Every fresh attack adds considerably to the effusion, and consequently to the morbid size of the limb, and exacerbates every symptom; and hence the greater severity of this species than of the former, and the monstrous disfigurement of the leg and foot by which it is distinguished. In many instances, also, the inflammation extends to the surrounding as well as to the descending parts; and hence the scrotum, like the pubes in puerperal bucnemia, is often peculiarly affected and distended to an enormous magnitude; while, occasionally, the glands of the axilla participate with those of the groin, and the forearm becomes also enlarged. In a few instances, the disease is said to have commenced in the axilla; but such cases are very rare, and not well established.

In this manner the disease at length assumes a chronic character: the monstrous size and bloated wrinkles of the leg are rendered permanent; the pain, felt acutely at first, subsides gradually, and the brawny skin is altogether insensible. Yet, even from the first, except during the recurrence of the febrile paroxysms, the patient's constitution and general functions are little disturbed: and he sometimes lives to an advanced age, incommoded only by carrying about such a troublesome load of leg; which, however, as we have noticed already, is regarded in the Polynesian Isles as a badge of honour.

In our own country, the disease is rarely met with but in its confirmed and inveterate state, after repeated attacks of fever and effusion have completely altered the organization of the integuments, and rendered the limb altogether incurable. In this state, the distended skin is hard, firm, and peculiarly thickened, and even horny; while the muscles, tendons, ligaments, and bones are, for the most part, little affected. [Most of the cases noticed in London are in Africans. The editor has seen one or two such examples in St. Bartholomew's Hospital. The most remarkable of these was published in one of the early volumes of the Medical and Physical Journal.]

In this advanced stage, the disease seems to be altogether hopeless: nor in any stage has the practice hitherto pursued been productive of striking success. This has consisted chiefly in endeavours to alleviate the febrile paroxysms by laxatives and diaphoretics, and subsequently to strengthen the system by the bark. It would be better, perhaps, by active and repeated bleedings, as well general as local, and powerful purgatives, to endeavour to carry off the whole of the first effusion as quickly as possible; and then to direct our attention to a prevention of the paroxysms to which the constitution appears to be peculiarly subject, after a single one has taken place, by prohibiting exposure to the damp air of the evening, and by the use of tonics.

An original and chronic affection of this kind, in which the integuments of the legs were much thickened, the limbs swelled to such an extent as to prevent the patient from walking, and incrusted with such a vast quantity of brawny scurf and scales, that handfuls of them might be taken out of his bed every morning, was successfully attacked many years ago by a mistake of one plant for another. The case is related by Dr. Pulteney; and the patient, who had been recommended to swallow a table-spoonful of the juice of the water-parsnip, with two

* Trans. of the King's and Queen's College of Physicians, vol. v., p. 56. A woman died in La Charité in 1820, with what Andral calls elephantiasis of one of her lower extremities, but which, probably, corresponded to the cases arranged by Dr. Good under the present title. The muscles were found, after death, reduced to a few pale, slender fasciculi; but the cellular substance was converted into an enormous mass, very hard, and including in some places cells filled with a serous fluid. At certain points it had all the physical qualities of cartilage.—(Anat. Pathol., tom. i., p. 277.) The same author has also seen an extraordinary ossification of the layers of the intermuscular cellular tissue, in the leg of a subject that died with bucnemia. The muscles were in the state of atrophy. The osseous matter, which was deposited in the spaces between the layers of muscles, was blended, in the deeper part of the limb, with bony vegetations arising from the periosteum. —Vol. cit., p. 297.

† See the editor's Dict. of Practical Surgery, art. SCROTUM, published by Harper & Brothers, New-York, 1834.

spoonfuls of wine, every morning fasting, was erroneously supplied with half a pint of what afterward appeared to be the juice of the roots of the hemlock-dropwort (*œnanthe crocata*, Lin.): the first dose produced such a degree of vertigo, sickness, vomiting, cold sweats, and long-continued rigour, that it almost proved fatal. So strong, however, was the patient's desire of relief, that, with the intermission of one day, he repeated the dose with a slight diminution in the quantity. The effects were still violent, though somewhat less alarming; and he persisted in using half the quantity for several weeks. At the end of a month he was very greatly improved, and, shortly afterward, the whole of his symptoms had nearly left him.—(*Phil. Trans.*, vol. lxii.)

Amputation of the affected leg has sometimes been made trial of, but apparently without any success. Dr. Schilling informs us, that in some, a locked jaw takes place about the seventh day from the operation, which is soon followed by tetanus, and ends in death; that, in others, fatal convulsions ensue immediately; and that those who survive the operation, have wounds hereby produced that will not heal; while the disorder, still connected with constitutional causes, often seizes on the other foot.—(*G. G. Schillingii de Leprâ Commentationes*, 8vo., Lugd. Batav., 1776.) And, in this last assertion, he is corroborated by one or two cases related by Dr. Hendy.—(*On the Glandular Disease of Barbadoes*, 8vo., 1784.)

[In the modification of the disease represented by Dr. Graves as common in Ireland, and as following fever and repeated attacks of a kind of inflammation, more like erysipelas than any thing else, he suggests the following treatment. When the case is not of very long standing he recommends, during the febrile paroxysms, antiphlogistic treatment, purgatives, leeches repeatedly to the inflamed parts, and cold lotions. During the intermissions, rest, moderately tight bandages, bark, and, if it fails, arsenic. The moment the inflammatory paroxysms recur, the antiphlogistic plan is to be resumed.]—(*Dr. Graves, in Trans. of the King's and Queen's College of Physicians*, vol. v., p. 46.)

GENUS XII.

ARTHROSIA.

ARTICULAR INFLAMMATION.

INFLAMMATION MOSTLY CONFINED TO THE JOINTS; SEVERELY PAINFUL; OCCASIONALLY EXTENDING TO THE SURROUNDING MUSCLES.

ARTHROSIA is a term derived from ἀρθρόω, "to articulate," whence arthrosis, arthritis, and many other medical derivations. The usual term for the present genus of diseases, among the Greek physicians, was *arthritis*, which would have been continued without any change, but that for the sake of simplicity and regularity, the author has been anxious to restrain the termination *itis* to the different species of the genus EMPHRAMA.

Arthritis, then, among the Greeks, was used in a generic sense, so as to include articular inflammations generally. But as almost every sort of articular inflammation has, in recent times, been advanced to the rank of a distinct genus in itself, it has frequently become a question, to which of them the old generic term should be peculiarly restrained. And hence some writers have applied and limited it to gout; others have made it embrace both gout and rheumatism; others again have appropriated it to white swelling; while a fourth class of writers, in order to avoid all obscurity and dispute, have banished the term altogether.

Now gout, rheumatism, whether acute or chronic, and white swelling, however they may differ in various points, as well of symptoms as of treatment, have striking characters that seem naturally to unite them into one common group. Gout and rheumatism are so nearly allied in their more perfect forms, as to be distinguished with considerable difficulty; and in many instances, rather by the collateral circumstances of temperament, period of life, obvious or unobvious cause, antecedent affection or health of the digestive function, than from the actual symptoms themselves. Stoll maintains that they are only varieties (*Rat. Med.*, part iii., p. 122–137; v., p. 420) of the same disease: Bergius, that they are convertible affections. White swelling, in one of its varieties, is now uniformly regarded as a sequel of rheumatism, or the result of a rheumatic diathesis; while the other varieties cannot be separated from the species.

From the close connexion between gout and rheumatism, Sauvages, and various other nosologists, distinguish some of the cases of disguised gout by the name of *rheumatic gout*. Mr. Hunter warmly opposed this compound appellation; for his doctrine was, that no distinct diseases, or even diseased diathesis, can co-exist in the same constitution. And, as a common law of nature, the observation is, I believe, strictly correct; one of the most frequent examples of which is the suspension of phthisis during the irritation of pregnancy. But it is a law subject to many exceptions; for we shall have occasion, as we proceed, to notice the co-existence of measles and smallpox; and I had not long since under my care, a lady in her forty-ninth year, of delicate health and gouty diathesis, who was labouring under a severe and decisive fit of gout in the foot, which was prodigiously tumefied and inflamed, and had been so for several days, brought on by a violent attack of lumbago,* to which she was then a victim, and which rendered her nights more especially sleepless and highly painful. The constitutional disease had in this case been roused into action by the superadded irritation of the accidental disease; and the two were running their course conjointly. It is also

* Lumbago is so common in gouty subjects, that the editor is inclined to believe it is as frequently met with in them as in rheumatic patients. He cannot, therefore, regard the above case as decidedly proving the co-existence of gout and rheumatism in the same individual

a striking fact, that one of the severest illnesses that attacked Mr. Hunter's own person, and which ultimately proved to be disguised gout, *podagrala rvata*, he suspected, in its onset, to be a rheumatic ailment. The case, as given by Sir Everard Home, in his life of Mr. Hunter, is highly interesting and curious, as showing the singular forms which this morbid Proteus sometimes affects, and the various seats it occupies; as also, that a life of abstemiousness and activity is no certain security against its attack; for Mr. Hunter had at this time drunk no wine for four or five years, and allowed himself but little sleep at night.

Arthrosia, therefore, as a genus, may, I think, be fairly allowed to embrace the following species:

1. Arthrosia Acuta. Acute Rheumatism.
2. ——— Chronica. Chronic Rheumatism.
3. ——— Podagra. Gout.
4. ——— Hydarthrus. White Swelling.

SPECIES I.

ARTHROSIA ACUTA

ACUTE RHEUMATISM.

PAIN, INFLAMMATION, AND FULNESS, USUALLY ABOUT THE LARGER JOINTS AND SURROUNDING MUSCLES; OFTEN WANDERING; URINE DEPOSITING A LATERITIOUS SEDIMENT; FEVER A CAUMA.

The disease varies in respect to violence of the fever, and seat of the pain. The varieties, determined mostly from the last feature, are as follow:—

α Artuum. Articular rheumatism.	Pain felt chiefly in the joints and muscles of the extremities.
β Lumborum. Lumbago.	Pain felt chiefly in the loins; and mostly shooting upwards.
γ Coxendicis. Sciatica.	Pain felt chiefly in the hip-joint, producing emaciation of the nates on the side affected, or an elongation of the limb.
δ Thoracis. Spurious pleurisy.	Pain felt chiefly in the muscles of the diaphragm, often producing pleurisy of the diaphragm.

The common remote cause of ARTICULAR RHEUMATISM, as of all the other varieties, is cold or damp applied when the body is heated: though it may possibly be produced by any other cause of inflammatory fever, where the constitution has a peculiar tendency to a rheumatic action. This tendency or diathesis seems to exist chiefly in the strong, the young, and the active; for, though it may attack persons of every age and habit, these are principally its victims. We may hence, as well as from its symptoms, prove rheumatism to be an inflammatory disease. "Even in the weak and emaciated," observes Dr. Parr, "the pulse is hard, the blood coriaceous, and bleeding often indispensable." [Rheumatism is seldom met with in very young children, and, out of one hundred rheumatic patients, ninety are above the age of sixteen. The following is the result of what was noticed in relation to this point by M. Chomel, in La Charité. Out of seventy-three patients attacked by rheumatism, thirty-five were between the ages of fifteen and thirty, twenty-two between thirty and forty-five; seven between forty-five and sixty; seven were turned sixty; and only two were under fifteen.

Daily experience proves that both sexes are subject to rheumatism. If women more frequently escape from it, owing perhaps to their less robust constitutions, and their being generally less exposed to cold and damp than the other sex, they are still known to be particularly liable to it when, after being tenderly brought up, they are exposed to the exciting causes; and their tendency to be attacked by it is known to be increased by interruption of the menstrual discharge. Hence, also, women between the ages of forty and fifty frequently suffer from it. Rheumatism is not so prevalent in certain families as gout; in other terms, it is less hereditary. Yet, though the disease can hardly be called hereditary, an individual born of rheumatic parents will certainly be in greater risk of suffering from the complaint than another person whose parents were quite healthy. According to a table kept by M. Chomel, out of seventy-two rheumatic patients, thirty-six had rheumatic parents, twenty-four had healthy parents, and twelve could furnish no information on the subject.] How far the observation of Sir C. Wintringham is true, that those who have suffered amputation are susceptible of this disease more than others (*Comment. de Morbis quibusdam*, art. 79), the author cannot say from his own practice; but it is the remark of a physician who was not accustomed to form a hasty judgment.

[The generality of writers, down to the beginning of the present century, admit that the seat of rheumatism may be either in the muscles or the fibrous tissues, so called by Bichat, consisting of the capsules of the joints, fibrous sheaths, the periosteum, and other fibrous membranes, the aponeuroses, tendons, and ligaments. This is the doctrine of Rivière, F. Hoffman, A. Leroy, and Pinel; to whom is to be added M. Chomel. Among those who believe that rheumatism may be seated indifferently, either in the muscular system or the fibrous, some conceive that the disease never extends to the muscles but secondarily, and that it always first attacks the fibrous or ligamentous structures. Dr. Clutterbuck, in his lectures, even defines rheumatism to be an inflammation of the ligamentous structure, connected with the different joints, and covering the muscles attached to them; which is in fact the theory of Bichat. Dr. Scudamore, who regards the tendinous portions of the muscles as the seat of rheumatism, believes that, if the muscular fibres were inflamed, they would be affected with swelling, which is not the case, while an increase of volume is always observable in the fibrous structures attacked. In opposition to the

hypothesis of Dr. C. Smyth, that the essential seat of rheumatism is in the muscles, Dr. Scudamore does not consider the permanent weakness of these organs, the diminution in their size, the imperfection of their action, and the pain following their contraction, as proofs of the inflammation having its seat in the muscular fibres; but only as the consequences of the impairment of the synovial and tendinous structures, and of the extension or disturbance of these textures in a state of inflammation, whenever the muscles are put in action.

Acute rheumatism chiefly attacks the fibrous parts of the large joints of the shoulder, hip, knee, elbow, &c., and the muscular aponeuroses.* This inflammation is not in reality attended with much swelling of the texture essentially affected, the density of which prevents any considerable effusion of lymph into its interstices. It is true, however, as Dr. Clutterbuck has remarked, that a good deal of swelling often attends acute rheumatism; but this is owing to the extension of the inflammation into the surrounding cellular texture.]

A few years ago, the proximate cause of rheumatism was imputed to inflammation of the arteries themselves of the muscles and tendons; in short, to an immediate *arteritis*. Some cases and dissections, in support of this doctrine, were brought forward in France by M. Barde (*Obs. communiquées à la Société de Méd.*), and MM. Dalbant and Vaidy (*Dict. des Sciences Méd. Journ. Compl.*, vi., Août, 1819); but the anomalous diseases to which they refer have not been generally received as examples of rheumatism.

In the case related by Mr. Barde, the heart, all the larger arteries, and even the venæ cavæ, gave evident proofs of inflammatory action. Their coats were thickened, hardened, of a dark-red colour, in some parts covered with a whitish purulent matter, and in some the interior tunic was destroyed: the heart itself being considerably enlarged and inflamed.

[The foregoing hypothesis of arteritis being the proximate cause of acute rheumatism, is sufficiently refuted by the consideration, that, if it were true, rheumatism would always accompany arterial inflammation, which is not the fact. If another argument were required to subvert the opinion, it might be readily found in the flying and very wandering nature of rheumatic pains, which pass, as Bichat (*Anat. Gén.*, tom. ii., p. 263) expresses himself, with astonishing quickness, from one situation to another. Broussais, in his Leçons Pathologiques, thus accounts for rheumatism: "When," says he, "the action of the skin is diminished, it is determined to another part; and here it is to the capsules or articular ligaments, the textures around the joints, that the irritation is determined."]

In the general course of acute rheumatism, its peculiar inflammation does not continue long enough in any one organ to injure the structure of the arterial tunics; often, in effect, as in gout, we witness its disappearance in a moment, and find it migrating to some other part of the body.

As a general rule, it may be asserted, that rheumatic inflammation does not tend to suppuration. [It is one of the characters of the fibrous system hardly ever to suppurate. Bichat believed that rheumatic inflammation never ended in the formation of an abscess, though coagulable lymph might be sometimes effused round the tendons affected.] In a few rare instances, the contrary has been known to take place (*Morgagni, De Sed. et Caus. Morb.*, ep. lvii., art. 20; *Med. Comment. Edin.*, vol. iv., p. 198); and, in one or two cases, I have myself been a witness to an extensive abscess. But the general rule is not disturbed by such rare exceptions. The inflammation, therefore, is of a peculiar kind. There will often, indeed, be effusion, and the limb will swell considerably; but the effused fluid is gradually absorbed, and the swelling not unfrequently, though not always, is accompanied with an alleviation of the pain.

Sometimes the pains take the precedency of the fever; but, in other cases, the fever appears first, and the local affection does not discover itself till a few days afterward.* There is no joint, except perhaps the extreme and minute joints of the fingers and toes, but is susceptible of its attack, although it usually commences in, and even confines itself to, the larger. Among these, however, it frequently wanders most capriciously, passing rapidly from the shoulders to the elbows, wrists, loins, hips, knees, or ankles, without observing any order, or enabling us in any way to prognosticate its course; always enlarging the part on which it alights, and rendering it peculiarly tender to the touch. The urine is often at first pale, but soon becomes high-coloured, and deposites a red sediment. It may be distinguished from gout by being little connected with dyspepsy, commencing less suddenly, evincing more regularly-marked exacerbations at night, but less clear remissions at any time: to which we may add, its attachment to the larger, rather than the smaller joints; and its connexion with exposure to cold and damp. It runs on from a fortnight to three weeks; and the average of the pulse is rarely under a hundred.

The fever is generally accompanied with copious and clammy sweats [often of an exceedingly sour smell]; but the skin still feels tense and harsh; nor does the sweat issue freely from

* The parts are generally hot and red, and frequently the pain is situated in the theca of the tendons: Dr. Elliotson has noticed red streaks in the direction of the latter parts.—Lect. at Lond. Univ., as published in Med. Gaz. for 1833, p. 852.—Ed.

* Acute rheumatism presents a state of active fever, accompanied with inflammation of the fibrous tissues about the joints. One point not entirely decided is, whether the fever is the cause or the effect of the inflammation? Sydenham adopted the first of these views, which has found an able advocate in Dr. Barlow (Cyclop. of Pract. Med., art. Rheumatism), who endeavours to prove (a fact generally acknowledged) that the state of the constitution is what principally claims regard in the treatment of acute rheumatism.—Ed.

the immediate seat of pain. It seems to be an ineffectual effort of the remedial power of nature to carry off the complaint: for it is by this evacuation alone that we can at length succeed in effecting a cure. But the perspiration will be always found unavailing, so long as it continues clammy, and the skin feels harsh, and there is a sense of chilliness creeping over the body, or any part of it, during the perspirable stage. The exacerbation, which regularly returns in the evening, increases during the night, at which time the pains become most severe; and are then chiefly disposed to shift from one joint to another.*

[Acute rheumatism is not, generally speaking, attended with danger. Sometimes, however, it induces inflammation in parts of great importance to life; seemingly, in consequence of their partaking more or less of the ligamentous or fibrous tissue. The periosteum is a structure that is frequently attacked; and hence those aching pains in the bones by which patients are severely tortured. The pericardium is another organ to which rheumatic inflammation is frequently directed: the case being indicated by great pain in the region of the heart, and great disorder in the action of this viscus. Sometimes the dura mater, another fibrous membrane, suffers; the patient being afflicted with severe headache and delirium, and often falling a victim to the disease. There is also no doubt, that the pleura and diaphragm are very liable to acute rheumatic inflammation; and surgeons most experienced in diseases of the eye, recognise a species of rheumatic inflammation to which that organ is subject, and which has its seat in the sclerotic coat, whose fibrous texture is well known. Frequently it affects the loins, producing *lumbago*; the muscles at the back of the neck, the face, or any other part, where fibrous membranes, aponeuroses, ligaments, tendons, or perhaps muscles, are situated.]

Where fever is violent, and especially where the frame is robust, our only effectual remedies are copious bleeding and the use of diaphoretics: by the former, which will often demand repetition, we take off the inflammatory diathesis; and by the latter, we follow up the indication which nature herself seems to point out, and endeavour, by still farther relaxing the extremities of the capillaries, to render that effectual, which, without such collateral assistance, is, as already observed, for the most part exerted in vain, and with an unprofitable expenditure of strength. The most useful diaphoretic is Dover's powder; and its benefit will often be increased if employed in union with the acetated ammonia, and sometimes if combined with camphire. Aperients are useful to a certain extent; but they have not been found so serviceable as in various other inflammations. Small doses of calomel have occasionally, however, seemed to shorten the term of the disease, though they have not much influence in diminishing the pain. To obtain this, Dr. Hamilton has combined calomel with opium; and, in his hands, it appears to have been successful. Opium alone is rather injurious; nor has any decided benefit resulted from other narcotics, as hyoscyamus, hemlock, and aconite.

No constitution is invulnerable to the attack of rheumatism, although the young and the vigorous fall most frequently a prey to its torture. Hence not unfrequently we meet with it in persons of weak and irritable habits, who will not bear the lancet with that freedom which gives any chance of its being useful. Local bleeding is here to be preferred, but it cannot be depended upon; since, though the pain may diminish, or even totally subside, it is in many cases only to make its appearance in some other quarter.* Here also, if in any case, we have reason to expect benefit from uniting stimulants with diaphoretics, as ammonia, camphire, and the resinous gums and balsams.

In such habits, and particularly if opium should disagree with the system, it may be worth while to try the rhododendron (r. *Chrysanthum*, Lin.). This plant is a native of the snowy summits of the Alps and mountains of Siberia; and in Russia, as we learn from Dr. Guthrie, is employed very generally, both in gout and rheumatism, with a full assurance of success, a cure seldom failing to be effected after three or four doses (*Med. Comment.*, vol. v., p. 434): in consequence of which, it has formed an article in the Materia Medica of the Russian Pharmacopœia for nearly a century. Dr. Home tried it upon a pretty extensive scale in the Edinburgh Infirmary, and found that it acts both as a powerful diaphoretic and narcotic; and is at the same time one of the most effective sedatives in the vegetable kingdom. In most of the cases it retarded the pulse very considerably, and, in one instance, reduced it to thirty-eight strokes in a minute. It has also the advantage of occasionally proving aperient. But it sometimes produces vertigo and nausea; and, as a general medicine, is not to be preferred to Dover's powder (*Clinical Experiments, Histories of Dissections*, 8vo., Edin., 1780), or even the antimonial powder with opium, where the latter can be borne without inconvenience.

It is possible also in habits of this irritable kind, if in any, that we are to look for that extraordinary and decisive benefit from a free use of the bark at an early period of the disease, which we are told has been obtained. Contem-

* When the disease subsides, the parts do not desquamate and itch, as they do after gout; but they merely cease to be hot, swollen, and inflamed. (Dr. Elliotson's Lectures.) Rheumatism does not begin, like gout, particularly in the night-time; and it arises from an evident exciting cause, exposure to cold, or cold and wet, which is not the usual occasion of gout. In the latter disease, you have not, in the early stage, the same tendency to profuse and often sour perspirations.—Ed.

* Dr. Elliotson finds that free local bleeding generally answers better than venesection; and he observes, that whether leeches or cupping be employed, great benefit will result from applying cold lotions as long as the temperature of the part is higher than it ought to be.—See his Lectures at the Lond. Univ., as published in the Med. Gaz. for 1833, p. 853.—Ed.

plated as a highly acute inflammatory affection, nothing could at first sight appear to be more inconsistent with all rational practice than the use of such a medicine, and every one must feel predisposed to coincide with Dr. Cullen, when he tells us, in reference to acute rheumatism, "I hold the bark to be absolutely improper, and have found it to be manifestly hurtful, especially in its beginning, and in its truly inflammatory state."—(*Mat. Med.*, part ii., ch. ii., p. 100.) Yet, in direct opposition to such feelings and such assertion, we find the bark freely prescribed from the onset of acute rheumatism, apparently with success, by Dr. Morton, who seems first to have recommended it for this purpose, Sir Edward Hulse, Dr. Hugh Smith, Dr. Fothergill, Dr. George Fordyce, and Dr. Haygarth of Chester.* Dr. Fordyce affirms distinctly, that, at the time of writing, he had for fifteen years relinquished bleeding in favour of the bark; and that, during this period of time, he had not above two or three patients out of several hundreds for whom he had prescribed it; and had rarely met with any instance of a metastasis, a very common occurrence when he was in the habit of employing copious bleeding.—(*On Fever*, dissert. iii.)

I have also tried the bark in various instances from an early period of the disease, and when the bowels were free from confinement: but I have rarely met with success, and have often, like Dr. Cullen, had reason to think it injurious. [When a trial of bark is judged proper, the sulphate of quinine is a convenient preparation that should not be forgotten. Indeed, it has already been recommended by Dr. Whiting (see *Lond. Med. Phys. Journ.*, Feb., 1826) and others.] •

The above remarks will apply to the other varieties of acute rheumatism as well as to the first, that which affects the joints generally, and is the most common form under which the disease shows itself: yet the few following observations, more immediately directed to the other varieties, may not be altogether unprofitable.

LUMBAGO has sometimes been confounded with nephritis, or a calculus in the kidneys or ureters; but the proper nephritic affections are distinguished by some irregularity in the secretion of urine, and, as we have already had occasion to observe, with a numbness shooting down the thigh, and a retraction of either testicle.

RHEUMATISM OF THE HIP-JOINT was called among the Latins *ischias*, from *ἰσχίος*, the Greek term for hip; which was afterward corrupted into isciatica or sciatica; a word that has occasionally found its way into the dramatic poetry of our own country, as in Shakspeare's Timon,

"—The cold SCIATICA
Cripple our senators, that their limbs may halt
As lamely as their manners."

This variety, at its onset, has sometimes been mistaken for a phlegmonous inflammation of the psoas muscle. But in the latter there is, from the first, less tenderness to the touch, but much more enlargement, and the pain shoots higher into the loins. In sciatica, indeed, the whole limb, instead of continuing to swell, soon wastes away, and the emaciation extends to the nates of the affected side, so that the muscles have neither strength nor substance; while the thigh seems elongated.

When ACUTE RHEUMATISM attacks the PLEURA,* or any of its duplicatures or appendages, it exhibits many of the symptoms of pleurisy or peripneumony. But here, also, as in every other case of rheumatism, we have much greater tenderness upon pressure than in phlogotic inflammation, while the pyrectic symptoms are considerably less, and often highly disproportionate to the pain that is endured, so that the degree of pain and that of fever become no measure for each other.

There is this peculiar character belonging to the three last varieties, that though they are less disposed to wander *generally* than the first, they are peculiarly apt to run into each other's proper field, and to affect the stomach, which, in consequence, becomes sometimes enormously flatulent and expanded, with a sense of heat like that of a burning coal. If the back or loins be pressed hard to obtain ease, the pain is transferred to the side or stomach; and if the pressure be followed up into the side, it returns with violence to the back or hips; or the breathing is impeded, and can only be carried on in an erect position.—(*Cartheuser, Diss. de Lumbagine rheumatica*, Fr., 1755; *Scheid, Diss. de Lumbag. rheumat.*, Arg., 1794.)

Generally speaking, however, in these three varieties the disease is less erratic than in the first, and particularly in lumbago and sciatica. And it is owing to this fact that the loins and

* Clinical Hist. of Diseases, 1805. On this point Dr. Elliotson has the following remarks:—"You will not find in Haygarth's work any authority for such practice. You will find in his book accounts of the successful treatment of rheumatism by bark; but then, it was not till he had evacuated the patient upwards and downwards, and employed the antiphlogistic plan. After that, it is said that it prevented the disease from recurring. I have not had occasion to use bark, for I have found the disease give way 'to antiphlogistic means, colchicum, and mercury.' The two best internal medicines are, without doubt, colchicum and mercury. Colchicum here, as in the case of gout, generally does no good till it purges; and when once it purges the patient thoroughly, the disease usually gives way. It should be given as in gout, with magnesia. As soon as it purges, it is right to desist, and also as soon as its effect ceases. If you give a dose of one, two, or three minims of hydrocyanic acid with the colchicum, it sits better on the stomach." In obstinate cases, instead of going on with colchicum, Dr. Elliotson exhibits mercury, and makes the mouth tender. "If you do this in the first instance, instead of giving colchicum, the success is about the same. Colchicum may gripe, and mercury may make the mouth sore, so that you may not be able to continue them, and you may then leave off the one, whichever it may be, and exhibit the other; or, if you begin with one, and find it does no good, you may exhibit the other."—ED.

* This case is most commonly believed not to affect the pleura at all, but merely the muscles or fibrous tissues of the parietes of the chest.—ED.

the hip, from having been more uniformly affected, are often so long, even after the complaint has subsided, before they recover any degree of tone, so that the patient is frequently a cripple for many months; and still suffers from chronic rheumatism.

Local applications, which are rarely of service in the first or articulate variety, as the pain is so apt to wander from every joint to every joint, may in all these be frequently employed with more advantage; and where general and copious bleeding may be contra-indicated, leeches or cupping have often afforded considerable relief. The compound camphire liniment, as an elegant rubefacient, is perhaps more frequently employed than any other medicine of the same tribe, but it dries too soon upon the skin, and heats and stimulates without exciting moisture; and hence it is less useful than camphire dissolved in oil, or oil united with ammonia. In all these applications, however, the friction with a warm hand is of itself highly serviceable, and should be long persevered in and frequently repeated. And on this account, essential advantage has often been derived in cases of lumbago, or where the rheumatism has fixed itself between the shoulders, from a waistcoat of the coarsest brown paper, worn close to the skin, which excites a gentle moisture, both by its perpetual friction and the stimulus of the tar with which it is so largely impregnated. [After the acute stage of lumbago, great benefit may often be derived from the Burgundy pitch plaster, or emplastrum picis comp. Dr. Clutterbuck has sometimes succeeded in relieving lumbago by half a grain of elaterium, followed by a grain or two of opium: it generally excites both vomiting and purging. Of course, one would only have recourse to such treatment in a case attended with great severity and obstinacy.*]

Blisters seem rarely to be of all the advantage we should expect; but the vesication from sinapisms succeeds better than that from cantharides. The burning of moxa is a favourite remedy on the continent, but has been little tried in our own country, and is more suited for the chronic form of the disease. The tartar emetic ointment has been also frequently made use of, and sometimes with success: it gives a permanent irritation, but the exulcerations it produces frequently prove foul and troublesome. Dr. Perceval of Dublin, in a manuscript note to the volume of Nosology, tells me that, in sciatica, he has known the pain removed by a sweating course of James's powder, after a considerable emaciation of the nates.

Bark and gentle stimulants, as guaiacum, bardana, and seneka, may be used with advantage, with a liberal regimen and chalybeate waters. Sulphureous fumigation has also of late been very extensively employed on the continent, and partially in our own country, in the cure of both the present and ensuing species, and, according to the testimony of those who have employed it, with great success. M. Galés, of Paris, who seems first to have tried it, affirms, that of sixty-five patients who were submitted to it, twenty-five were cured, thirty-two much relieved, while only eight received no benefit. Mr. Wallace, who has also tried it at Dublin on a large scale, does not speak so decisively of its benefit in these complaints as in cutaneous eruptions.—(*Obs. on Sulphureous Fumigation, as a Remedy in Rheumatism and Diseases of the Skin*, Dublin, 1820.)

* In severe lumbago, Dr. Elliotson has recourse to cupping on the loins, and gives a large dose of opium (three grains), which is followed by half a drachm of vinum colchici every eight hours.—(See Clinical Lect., Lancet, 1830-31, p. 492.) I have always found an active purgative one of the best *incipient measures*, whatever may be the rest of *the treatment*.—*Ed.*

SPECIES II.

ARTHROSIA CHRONICA.

CHRONIC RHEUMATISM.

PAIN, WEAKNESS, AND RIGIDITY OF THE LARGER JOINTS AND SURROUNDING MUSCLES; INCREASED BY MOTION; RELIEVED BY WARMTH; LIMBS SPONTANEOUSLY OR EASILY GROWING COLD; FEVER AND SWELLING SLIGHT, OFTEN IMPERCEPTIBLE.

Concerning the proper position, and, in some sort, the nature of this disease, Dr. Cullen confesses himself at a great loss. In his Synopsis, he arranges it as a sequel of acute rheumatism, and so explains it in his definition: yet he gives it a distinct name, that of Arthrodynia, for the express purpose, as he tells us, of having a distinct name at hand for any one who may choose to regard it as a separate *genus*; and whoever is so disposed is at full liberty, he adds, as to any objection of his own. Yet, in his First Lines, he takes a different view, and perhaps a more correct one, than either of the above. Chronic rheumatism, instead of being a mere *sequel* of acute rheumatism, or a distinct *genus*, is here made a separate *species* of a common genus. "Of this disease," says Dr. Cullen, "there are two species, the one named the acute, and the other the chronic rheumatism." And in his subsequent description of the latter, instead of the universal assertion in his earlier work, "pro sequela rheumatismi acuti rheumatismum chronicum dictum *semper* habeo," he modifies it by the word *commonly*. "The chronic," says he, "is *commonly* a sequel of the acute rheumatism."—(*Aph.* cccci.)

There can be no doubt, indeed, that it is so, but as in many instances it is a distinct disease, characterized by symptoms of its own, and demanding a very different treatment, it ought certainly to be arranged as a distinct species.

Chronic rheumatism has as many, and nearly the same varieties, as the acute. It becomes fixed in the loins, in the hip, in the knee, but seldom in the thorax. Its symptoms are in most respects like those of acute rheumatism, only that there is little or no fever; so that, while the general heat is very considerable, and the pulse usually upwards of a hundred strokes in a minute in the acute species, the skin in the chronic species seldom exceeds its natural temperature, and the pulse is rarely quicker than

eighty strokes; the joints are less swollen, and of a pale, instead of a reddish hue, cold and stiff, and roused with difficulty to a perspiration, and always comforted by the application of warmth.*

The disease continues for an indefinite period, and sometimes only terminates with life itself. The affected joint is occasionally debilitated in the utmost degree, so that when the acute pain is not present, the weakness resembles that of a stroke of palsy.

Cold, the common cause of the acute rheumatism, is also a common cause of chronic, even where the acute species has not preceded: and violent strains and spasms may be enumerated as other causes. But, in these cases, the constitution must be peculiarly disposed to rheumatic action.

Every symptom proves most distinctly that the present is a disease of debility; and the mode of treatment must be founded upon this idea. Hence, stimulants of almost all kinds are found serviceable. Warm active balsams and resins, as those of copayva, cubebs (See *Dr. Crane's Obs. in Edin. Med. Journ.*, No. lxxix., p. 305), and guaiacum,† essential oils of all kinds, from resinous substances, as turpentine and amber; from aromatic or pungent plants, as camphire and mustard, and especially cajeput, the green distilled oil from the leaves of the *melaleuca leucodendron*, are all employed in their turn; sometimes alone, where they combine a sedative with a stimulant power, as camphire and cajeput, and sometimes in union with opium, which often proves a very valuable addition.

Most of these are also powerful diuretics; and, as acute rheumatism is best and soonest removed by warm sudorifics, so chronic rheumatism seems to be chiefly relieved, and, indeed, radically cured, by diuretics of a like stimulus. Hence, horseradish and garlic are often found serviceable, and turpentine still more so, which, in truth, forms the basis of the greater number of the medicines just enumerated. How far the arum, or dulcamara, may be specifically entitled to this character, I cannot determine from my own practice. They are both introduced into the table of diuretics by Dr. Cullen, and are highly commended by many physicians of great celebrity for their arthritic virtues. But it is possible that, whatever virtues of this kind they possess, are rather derived from their stimulating the excretories generally, and rousing the entire system, than from their acting specifically upon the kidneys. The *colchicum autumnale*, which has sometimes [the author might have said, very frequently] proved serviceable, has more decided pretensions to a diuretic character.‡

Local stimulants are here of more service than in the preceding species. The moxa has been more generally used on the continent for chronic than for acute rheumatism, and is certainly more entitled to a trial. It is peculiarly recommended by Larrey.—(*Recueil de Mémoires de Chirurgie*, &c., 8vo., Paris, 1821.) In our own country, however, practitioners have far more generally had recourse to cataplasms of ammonia, cummin, and mustard-seeds, occasionally intermixed with euphorbium or cantharides; or, in their stead, have made use of friction, and, which is far preferable, the vapour-bath, brine, warm-bathing, and have afterward kept the joint well-clothed with flannel, and sent through the organ small shocks of electricity, or roused it by the stimulus of the voltaic trough. Sulphureous fumigations, or the application of sulphur in a gaseous form, as first employed by Dr. Galès of Paris, are in common use on the continent, and have occasionally been employed with success in our own country. And, when every thing else has failed, the patient is usually advised to try, what, perhaps, it would be better that he should try at first, the mysterious agency of the Bath waters.

The arsenic solution I have never tried in this complaint.§ It is strongly recommended by Dr.

* Occasionally the symptoms will be like those of acute rheumatism, only less violent. In general, however, the sweating does not continue, and the parts are not above their natural temperature, as they are in acute rheumatism. "It is sometimes rather difficult," says Dr. Elliotson, "to make an accurate diagnosis. If the disease has been acute rheumatism at first, you will find there has been sweating."—Lectures at Lond. Univ., in Med Gaz. for 1833, p. 852.—Ed.

† One of the best stimulants in cases of chronic rheumatism is the ammoniated tincture of guaiacum. This is a medicine given in various doses, from thirty drops to a drachm at a time; and Dr. Elliotson has known patients who took ʒvj. three or four times a day. Sometimes, says he, it purges, and sometimes it produces the nettle-rash; but, "when internal stimulants are necessary in rheumatism, I think this is one of the best."—Lectures at Lond. Univ., &c.—Ed.

‡ Dr. Good, among the numerous medicines specified by him as having been recommended for chronic rheumatism, makes no mention of mercury. Whether the parts are hotter than they should be or not, Dr. Elliotson finds obstinate cases, especially such as are attended with exacerbation of the pain in the night, give way to mercury when they will not yield to any other medicine. All men of experience know how frequently pains in the bones, from syphilis, are supposed at first to be merely chronic rheumatism, and how quickly mercury sometimes relieves them.—Ed.

§ Generally speaking, the arsenical solution is used with reluctance by Americans: its action on the stomach, and its peculiar influence in causing pain in the limbs, &c., have been repeatedly observed; in some extremely obstinate cases, however, it may be found serviceable, but we should begin with half the dose prescribed by our author. Among external applications, few remedies can compare with the oil of cajeput, which may be rubbed on the affected part in combination with olive-oil or camphorated liniment: carded cotton is often far more soothing to the painful limb than flannel; strips of oiled silk and of caoutchouc have also been highly recommended.

The late work on Neuralgic Affections by Mr. Teal, has enlarged our views of the mysterious nature of rheumatism: he contends that rheumatic affections, and even neuralgia itself, frequently depend on an irritation, or a partial degree of inflammation, at the origin of the spinal nerves: and hence, he observes, we may sometimes trace the

Bardsley (*Medical Reports*), and, in his hands, it seems often to have succeeded. It may be commenced in doses of ten drops, and gradually increased to double this quantity, and should be united with a few drops of laudanum if it sit uneasy on the stomach by itself. The colchicum wine and vinegar have certainly been employed with great and decided benefit in chronic rheumatism, to which they are more adapted than to the acute form of the disease.*

In many of the eastern parts of the world, and particularly in China and Japan, a mode of treatment for various acute muscular and nervous pains has been in immemorial use, under the name of zin-king, or needle-pricking, and consists in pushing from two to five or six finely-pointed gold or silver needles, at a small distance from each other, into the seat of pain, to the depth of from half an inch to an inch, or something more. This has of late been tried, under the name of acupuncture, in France, by M. Berlioz (*Mémoire sur les Maladies Chroniques, les Evacuations Sanguines, et l'Acupuncture*, Paris, 1816), and other practitioners, and in our own country by Mr. Churchill (*A Treatise on Acupuncturation*, &c., Lond., 1828), for various affections of the above character, but particularly in severe chronic rheumatism, and, according to the accounts published, with considerable and almost instantaneous relief. The puncture produces little or no pain, and should be followed by no hemorrhage. A single puncture is often found sufficient to remove the ache, though it shoots occasionally to some neighbouring part; in which case, the same process is to be followed up to the seat of metastasis, when it is usually found to vanish altogether. The needle, when introduced, is suffered to remain in each puncture for about five minutes before it is withdrawn, and, in this part of the world, is commonly made of fine steel. [Dr. Elliotson has employed acupuncture very extensively: his experience confirms the observation of Mr. Churchill, that it is chiefly useful in the rheumatism of fleshy parts, and in chronic cases. Like the same writer, he also finds one needle, left an hour or two in a part, more efficient than several applied but a few minutes. Of forty-two cases thus treated, thirty were cured: and the other twelve, being more or less acute, were not adapted for it, and yielded to antiphlogistic treatment.—(See *Med. Chir. Trans.*, vol. xiii., p. 467.) Some writers would attempt to explain the modus operandi of acupuncture on the principle of counter-irritation; but M. Pouillet has endeavoured to show by experiments that electro-magnetic phenomena take place in the operation.—(See *Journ. de Physiologie Expér., par F. Magendie*, tom v., art. i.)]

When the disease is limited to the extremities, whether of the arms or legs, flannel bandages have often been found highly serviceable; and they should be applied with as much tightness as the patient can bear without inconvenience.—(*Trans. of King's and Queen's College, Dublin*; *Dr. Gratton*, vol. i., p. 169, 1817.)

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chronic sufferings of rheumatism to spinal disorder. Acting on this belief, Dr. J. K. Mitchell, of Philadelphia, has applied cupping-glasses over the spinal region, and soon removed pains of a rheumatic nature. The same practice has been successfully followed by Dr. R. H. Thomas, of Baltimore.—(N. A. Archives of Med. and Surg., &c., vol. i., p. 189.) Dr. Eberle remarks, "it would appear, that in many cases of fixed pain simulating rheumatism, one or more of the vertebræ of the spine are very tender to pressure, and that if in such cases leeches or cups be applied over the diseased portion of the spinal marrow, almost immediate removal of the rheumatic pains will be effected."—(Practice of Medicine, vol. i.) As a dernier resort, the waters of the White and Salt Sulphur Springs, and the Warm Springs of Virginia, which are highly recommended by Dr. M. Page, of Richmond, the Bluelick and Harrodsburgh Springs in Kentucky (Yandell, in Transylvania Journal of Medicine, vol. v. p. 375), or the Avon mineral waters in the state of New-York, may often be used with advantage.—D.

* Dr. Elliotson adds his testimony in support of the excellent effect of arsenic on chronic rheumatism. The stomach will bear it better, if hydrocyanic acid be given with it or just before it. Dr. Good's first doses of the arsenical solution are greater than what practitioners usually venture upon. It is best to begin with two or three minims, and increase the quantity gradually: few patients can bear above seven or eight minims. Although there may be no danger in the œdema sometimes caused by this mineral, Dr. Elliotson regards the circumstance, when it occurs, as a sufficient reason for discontinuing it. Were any gastritic affection to be produced by arsenic, perseverance with the medicine would, of course, be dangerous. When the disease assumes an intermittent form, Dr. Elliotson gives either arsenic or a large dose of bark or quinine, either just before a paroxysm is expected or afterward, or smaller doses in the intervals. He also speaks very favourably of the effects of a narcotic, given in a full dose just before the pain is about to begin; as, for instance, one grain of stramonium, repeated in two or three hours if necessary, and the head remain unaffected. Were the medicine to excite drowsiness, giddiness, or delirium, ane metic would be proper.—Ed.

SPECIES III.

ARTHROSIA PODAGRA

GOUT.

PAIN, INFLAMMATION, AND FULNESS, CHIEFLY ABOUT THE SMALLER JOINTS; RETURNING AFTER INTERVALS, OFTEN PRECEDED BY, OR ALTERNATING WITH, UNUSUAL AFFECTIONS OF THE STOMACH, OR OTHER INTERNAL PARTS: UNSUPPURATIVE.

The origin of the term gout, or *goutte*, in French, is little known, or rather is almost forgotten. Among the ancients, most diseases accompanied with tumefaction were ascribed to a flow of some morbid fluid or humour to the part affected, which was called a rheum or defluxion; and the rheum or defluxion was denominated cold, hot, acrid, saline, or viscid, according to the nature of the symptoms. The Arabian writers ascribed even this cause to various diseases of the eyes, which were hence called gutta serena, and gutta obscura, "clear or cloudy drops, or defluxions," according to the external appear-

ance. Rheumatism and gout were alike attributed to the same origin: and, as the terms *rheuma* and *gutta* were used in medicine synonymously, both importing defluxion, the old opinion is still verbally preserved, and has descended to us in the names of rheumatism and gout, though the old pathology has been abandoned. "We have still," says Dr. Parr, "the treatise of Carpinati, published at Padua in 1609, De GUTTA, seu Junctuarum dolore; but the term may be traced to Valescus de Tarenta, who wrote his Commentary early in the fifteenth century; and Schneider, in his Liber Catarrhorum Specialissimus, published at Wittenburg in 1664, usually denominated the sixth volume, and peculiarly scarce, describes the gout as a catarrh."—(*Med. Dict., App.*) [The term, however, is still more ancient, and was used by Radulphus, a Dominican of the thirteenth century, who writes, "cum *guttâ*, quam podagram, vel arthriticam vocant, frequenter vexareter."]

The resemblance between gout and rheumatism is so close, that the one is often mistaken for the other; and both by Bergius were regarded as convertible; yet, while the former chiefly fixes on the small joints, the latter attacks the large; and the first is often hereditary, while the second is rarely or never so. Gout is far more connected with a dyspeptic state of the stomach than rheumatism: its incursions are, for the most part, more sudden, its nocturnal exacerbations less striking, but its remissions much clearer. While rheumatism mostly begins in the shoulder or elbow, gout always begins in the foot or ankle.

Gout, moreover, is a far more complicated complaint than rheumatism; and hence there is no disease to which the human frame is subject, that has led to such a variety of opinions, both in theory and practice, many of them directly contradictory to each other, as the gout; and I may add, there is no disease, concerning the nature and treatment of which physicians are so little agreed; so that, to this moment, it constitutes perhaps the widest field for empiricism, and the hottest for warfare, of any that lie within the domain of medical science.

Shutting the door to disputation and unfounded theory as far as we are able, let us, in as few words as possible, attend to the clear and established history of this disease as we would to that of any other, and draw our pathology and our mode of practice from the principles which it will be fairly found to inculcate.

In the first place, it is admitted on all hands, or at least with exceptions so few as scarcely to disturb the general consent, that gout, in whatever way it shows itself, is a disease of the system; or, in other words, is dependant upon a peculiar diathesis or state of the constitution. And next, it is as commonly admitted, that this diathesis is in some instances original, and in others hereditary or derived. There are many persons in whom this complaint makes its appearance, who can trace no such affection in their ancestors;* and as such persons are specially distinguished by a habit of indolence, luxury, and indulgence, and particularly in the pleasures of the table, it is from this habit that the gouty diathesis is supposed to originate. There are others who, though exhibiting a life of great regularity and abstemiousness, afford proofs of the same diathesis in occasional paroxysms to which it gives rise; and such persons are almost always capable of tracing it hereditarily. For the diathesis, having once established itself, keeps its hold on the system, and is propagated from race to race, whatever be the manner of life of the individual, or the general state of his constitution; though there can be no question, that those descendants are most subject to its paroxysms who indulge in the excesses that laid its first foundation.

A gouty diathesis, thus produced, may remain quiescent, and not discover itself for many years, till it meets with some occasional cause of excitement, when it shows itself by a sudden and painful disturbance of some part of the system;* but a disturbance of a very different kind, as well as affecting very different organs, according to the temperature, constitution, manner of life, or some incidental circumstance of the individual: where the general health is sound, fixing on one or more of the extremities, in the form of a peculiar but very acute inflammation, that runs through a regular paroxysm and gradually subsides; and, where the health is infirm, and the general form debilitated, exciting great derangement in some internal organ or set of organs, and particularly those of digestion; or shifting from one form to another, and thus proving itself, under every form, to be the same disease, and laying a foundation for the three following varieties:—

a Regularis. Regular fit of gout.	Pain, swelling, and inflammation of the affected joint considerable and acute; continuing for several days, often with remissions and exacerbations; then gradually resolving, and leaving the constitution in its usual or improved health.

* From some tables published by Sir Charles Scudamore, it appears that in a given number of gouty individuals, the majority acknowledged no hereditary claim to the disease. Yet we are not to imagine, from the result of this estimate, that, in a large proportion of cases, the predisposition is not received by children from their parents: the fact is familiarly known and universally acknowledged.—ED.

* "A state of plethora, absolute or relative," as Dr. Barlow observes, "precedes every accession of gout, and is the principal, if not the immediate cause of it. The intensity and duration of the paroxysm, too, are dependant on the degree of plethora prevailing, although other circumstances may contribute to prolong the attack. But, notwithstanding this, gout is not simply plethora leading to or ending in local inflammation. There is something more from which gout derives its distinctive character, and this ideal, at least unexplained existence it is, which constitutes the essence of gout."—Cyclop. of Pract. Med., art. GOUT.—ED.

β Larvata. Disguised; lurking atonic gout.	Disguised and lurking in the constitution, and producing derangement in the digestive or other functions, with only slight or fugitive affection of the joints.
γ Complicata. Retrograde; recedent; misplaced gout.	The disease fixing on some internal organ instead of on the joints; or suddenly transferred from the joints after having fixed there; producing in the internal organ affected debility or inflammation, according to the state of the constitution.

The predisposing cause of a gouty diathesis, when it first forms itself in an individual, is plethora, or the state of the system produced by full living and indolence.

An entonic state of the vessels, joined with plethora, may be set down as the predisposing cause to acquired gout; and this hypothesis seems consistent with the fact of the common occurrence of gout in strong robust individuals. When it has been transmitted hereditarily, it is more disposed to show itself in men of robust and large bodies, of large heads, of full and corpulent, and especially gluttonous habits, or whose skin exhibits a coarser surface, in consequence of being covered with a thicker rete mucosum.

[The middle and advanced periods of life are more disposed to gout than the early periods. Thus, it does not commonly attack men until after the age of thirty-five, and generally not till a still later period.* When the gout does appear in more early life, it seems to be in individuals in whom the hereditary disposition is exemplified, and to whom the exciting causes have been strongly applied. According to Hippocrates, eunuchs are not liable to gout, nor boys previously to venery; but these opinions are probably not very correct; since, with respect to the latter, the disease is well known to be almost peculiar to an advanced period of life; and the eunuchs, who, in the time of Hippocrates, were chiefly Persian slaves, were, in all likelihood, confined to the strict discipline and the frugal and temperate lives enjoined to all, and therefore not exposed to the most active causes of gout. For Galen, in his Commentary upon this observation of Hippocrates, tells us, that, in his time, the remark was no longer true, "owing to too much indulgence on their part in an indolent, as well as intemperate mode of life;" and the remark is confirmed by modern experience. There is a Greek epigram, literally signifying, "Of limb-relaxing Bacchus, and limb-relaxing Venus, is born a daughter, the limb-relaxing Gout." And a similar doctrine is contained in the adage, "Bacchus pater, Venus mater, et Ira obstetrix Arthritidis." While, says Dr. Bateman, this fact is confirmed on the one hand, by the testimony of ages, in the affirmative, it is corroborated also, on the other hand, by observation, in the negative. Dr. Cullen remarks, that gout seldom attacks those who are employed in bodily labour, or who live much upon vegetable aliment, or take no wine or fermented liquors. Indeed, the gout is said to be altogether unknown where these liquors are not used, as among the common people of Turkey. According to Van Swieten, some people, who, after being in comfortable circumstances, have been reduced to labour for their sustenance, and to exchange a luxurious table and indolence for a spare diet and activity, have never suffered from gout again. He mentions particularly the instance of a certain priest, who enjoyed a rich living, and had been an old and constant sufferer from gout, but, happening to be taken by the pirates of Barbary, he was kept constantly at work in the galleys for two years; "which had this good effect, that afterward, when he was ransomed from captivity, having lost all his troublesome and monstrous fatness, he never once had a fit, though he lived several years after the event." Various similar examples are related by Schenckius.—(*Obs. Med. Rarior.*, lib. v., p. 659, ed. 1644.) In a word, as Dr. Bateman remarks, much exercise, which will often counteract the influence of intemperance, will, when combined with temperance, counteract even the hereditary disposition to the disease.

Women are not very liable to gout, probably from their more regular and abstemious mode of living; but those females whom it attacks are generally of robust and full habits. It is said to be very rare before the cessation of menstruation, which, as Dr. Bateman thinks, only implies, that it is generally a disease of advanced life. For Dr. Cullen (*First Lines*, &c., § 494) has observed, that robust females are often attacked before the menses have ceased; and he knew of cases where it occurred in females whose courses were more abundant than usual.*]

The podagric diathesis must be distinguished from the paroxysms to which it gives rise, and which constitute the only manifest indications of its existence.

The paroxysms of gout are excited by certain occasional causes, some of which are obvious, and some doubtful, or altogether unknown; but, without the co-operation of these, the gouty diathesis may remain unnoticed, or quiescent in the body for years, or, perhaps, through the whole term of a man's life. And hence we often see an individual, whose ancestors have been notorious for this complaint, pass the whole of his days without betraying any marks of it, while it

* When the predisposition is strong, however, it may commence much earlier. The editor has seen several instances of it in persons not more *than twenty* years of age.—Ed.

* Bateman, in Rees's Cyclopædia, art. Gout. For this relative immunity of females from gout, they seem indebted to their greater temperance, and also to the facilities which the female constitution possesses of throwing off redundances by natural outlets. Dr. Gregory observed in his practice, that such women as suffered from gout had antecedently been subject to profuse hemorrhages, and were generally plethoric through indolence and high feeding.—Ed.

appears in one or more of his children, perhaps in their very boyhood.

The occasional causes are numerous; for, where the diathesis exists strongly, almost any thing that is capable of producing a general disturbance in the system, or of throwing it off the balance of ordinary health, is sufficient to become a cause; and this, whether the incitement be of an entonic or an atonic character. And hence, paroxysms in different individuals are often produced by intoxication, or excess of eating; violent emotions of the mind, particularly the depressing passions, as grief and terror; sudden exposure to cold when the skin is in a state of perspiration; wet applied to the feet; great labour of the body; severe application of the mind, especially when protracted, so as to break in upon a due allowance of sleep: cold, flatulent fruits, and often acidulous liquors; a sudden change from a spare to a full, or from a full to a spare diet; excessive evacuations of any kind; and, occasionally, a sudden cessation of such as are habitual.*

The more violent the attack of a paroxysm, and the longer its continuance, the more the diathesis is confirmed, and the oftener the attack is renewed. On which account, it is of great importance to alleviate and abridge the paroxysms as much as possible, and especially when they are as yet new to the system.

Whether particular climates or countries are more disposed to favour the existence of gout than others, separate from the occasional causes just adverted to, may be doubted.† Such an opinion, however, has prevailed among the vulgar, as well as among many of the more learned in most ages. Thus, among the Greeks, it was a popular belief, that Attica was the hotbed of gout, as Achaia was of ophthalmia: whence Lucretius,

"Atthide tentantur gressus, oculeique in Achæis finibus."‡

Gout clogs the feet in Attica, the sight
Fails in Achaia.

And thus, too, in more recent times, we are told that China (*Le Conte, Nouvelles Mémoires sur l'Etat present de la Chine*, Paris, 1696), and even some of the German provinces, are exempt from the attack of gout, while, in our own country, it exercises an almost irresistible sway. The last assertion is true enough; but we are not driven to the variable nature of our climate to account for the fact.

Thus far we can proceed safely, respecting the general pathology of this Proteus disease. But the moment we enter upon the field of its PROXIMATE CAUSE, we are bewildered in a hopeless labyrinth, without a thread to guide our entangled footsteps amid the growing darkness. There has, indeed, been no want of attempts to explain the subject; but thus far, they have been attempts alone; ingenious conjectures, rather than enucleated facts. Thus some, among whom was the learned Boerhaave, resolved the proximate cause of gout into a morbid texture of the nerves and capillaries; and others, into a peculiar acrimony of the fluids; respecting the nature of which, however, those who adopted this view were never able to agree; several of them, like Hoffmann, affirming it to be a tartaric salt, several a bilious salt, several again an acid and several again an alkali.

This morbid material, in whatever it consists, was supposed to be separated from the system, and thrown off during the continuance of the paroxysm, which, consequently, it became the duty of the physician to encourage. And by some pathologists it was held, that the morbid matter thus despumated has, in various instances, proved contagious, and this not to man only, but to other animals as well: thus M. Pietsch informs us, that he has known dogs affected with the same disease by licking the ulcers that have followed upon a fit of gout, accompanied with what he erroneously calls chalk-stones.

Dr. Cullen has taken great pains, in a series of nine consecutive arguments, to prove the error or absurdity of most of these opinions: and then he proceeds to establish his own; which consists in regarding the proximate cause of a gouty diathesis as dependant upon a certain vigorous and plethoric state of the system; and the proximate cause of a gouty paroxysm as produced by an occasional loss of tone in the extremities, often communicated to the whole system, but especially to the stomach, succeeded by a powerful reaction in the same quarter, which constitutes the pain and inflammation, and is an effort of the vis medicatrix naturæ to restore the tone thus injured.—(*Pract. of Phys.*, part i., b. ii., chap. xiv., DXXXIII.) But, by this hypothesis, we gain as little as by any of the preceding. It is obviously a mere extension of the Cullenian doctrine of fever to the disease before us, and is chargeable with the same incongruity: for here, as in fever, the stage of strength or increased energy is made to depend upon the stage of weakness; as the weakness or loss of tone is made dependant upon a peculiar vigour and plethoric state of the system. There is, indeed, no great difficulty in conceiving how loss of tone may follow excess of energy; but by what means recovered energy is to be a result of loss of tone, is a problem of more laborious solution.

One of the marks by which a REGULAR PAROXYSM of GOUT is said to be distinguished from that of rheumatism, is the suddenness of its onset. This is true, as Sydenham has correctly observed, with regard to the general course of regular gout, in which the constitution is in other respects perfectly sound. But in other cases

* The doctrine that lowering the diet, or that a change from a full to a spare diet, will excite gout, is one that the editor has never seen a confirmation of; and if it were true, he thinks that the well-fed gouty priest, taken by the Barbary pirates, and made to work in the galleys, as mentioned by Van Swieten, ought, at all events, not to have been cured by low living and hard labour. In Scotland there is an old saying, that any man may free himself from gout by working for, and living on, sixpence a day.—ED.

† Gout is by no means common in very hot climates; and the summer in this country materially diminishes the number of cases.—ED.

‡ De Rer. Nat., vi., 1117.

the fit is often preceded by certain prodromi, which those who have suffered from it before very sufficiently understand, and uniformly take as a warning; such as a coldness or numbness of the lower limbs, alternating with a sense of pricking or formication along their entire length; frequent cramps of the muscles of the legs; a crassament in the urine (*Butler, Nadere out dekkinge der menschelyke Waters, Harlem,* 1697); slight shiverings over the surface; languor and flatulence of the stomach; and sometimes a pain over the eyelids, or in some other organ.—(*Eph. Nat. Cur. Dec.*, i., ann. iii., obs. 252.)

The paroxysm is said by Dr. Sydenham, who has drawn its picture to the life, to show itself most commonly in January or February; but I have known it occur so often towards the close of the summer, and in the autumn, and have attended so many patients who have never had it except in the latter seasons, that the rule does not seem to be in any way very well established. The first attack is usually in one of the feet, most commonly about the ball or first joint of the great toe; it commences at night, or during the night, and there is sometimes, though not always, a slight horror, succeeded by a hot stage. The local pain and swelling increase in violence, the joint assumes a fiery redness, and the whole body is in a state of great restlessness. The symptoms remit sometimes towards the next morning, yet occasionally not till the morning after; but they still return during the night, though in a more tolerable degree, for three or four days, or even a week: when the inflammation subsides, as by resolution; the foot almost instantly recovers its vigour, as though nothing had been the matter with it; and if the patient have been antecedently indisposed, he enjoys, as on recovering from an ague, an alacrity of body and mind beyond what he has experienced for a long time before; the constitutional indisposition disappearing with the paroxysm.

At the commencement of the disease the return of it may be annual, or not oftener than once in three or four years; but it is perpetually encroaching on the constitution, so that the intervals gradually become shorter, and the attacks more frequent and of longer continuance: whence, as Dr. Cullen has justly observed, "in an advanced state of the disease, the patient is hardly ever tolerably free from it, except perhaps for two or three months in the summer."

Nothing can be more specific, more true to itself, or more distinct from every other kind of inflammation, than that of the disease before us, when thus exhibited in a regular fit; the inflammation of erythema does not differ more from that of phlegmon than both these, and, indeed, every other, from that of gout: it never suppurates, never ulcerates when simple and genuine, however violent may be the attack, and though, to the eye of inexperience, the skin may seem to be on the point of bursting; while, in the midst of the severest pain, there is a sense of numbness, weight, and want of energy; insomuch that, if the pain could for a moment be forgotten, the limb would feel paralytic; and, though the muscles which move the limb be not affected, they raise it or drag it along like a dead load. If the inflammation run through its course where it first fixes, it subsides by a resolution that leaves no external discoloration, or internal weakness or disability; and if it make a transfer from one extremity to another, it passes with inconceivable rapidity; the limb now affected being loaded with all the vehemence of the inflammatory action, and that lately the seat of pain being all of a sudden restored to perfect soundness.

It is rarely, however, that any metastasis takes place on its first appearance in a healthy constitution; nor indeed till after various organs, or the entire habit, have been weakened by repeated assaults. We have already observed, that it is the nature of the disease to weaken the habit in this manner till the system is completely broken down. In this case, the paroxysms, though much longer and more frequent, are less violent and painful than at first; but there is no joint exempt from its incursion, nor perhaps an internal organ that does not suffer from induced weakness: so that, in the language of Sydenham, "the patient exists only to be wretched and miserable, and not at all to taste of the happiness of life."

[In the inveterate and protracted form of the disease, the joints remain not only weak and stiff after the termination of the fit, but they become at length so contracted and disabled, that, although the patient can stand, and perhaps walk a little, yet it is very slowly, and with great lameness and difficulty. In many persons, though not in all, this immobility of the joints is further increased by the formation of concretions of a chalky appearance on the outside of them, and for the most part immediately under the skin. The secretion or deposition of this matter is characteristic of the disease, being the consequence of gouty inflammation alone. It seems to be deposited at first in a fluid form, but afterward becomes dry and firm; in which state the concretions have the appearance of a friable earthy substance, and have been erroneously called *chalk-stones*. By the investigations of Dr. Wollaston, however, it has been ascertained, that they contain no calcareous or earthy matter; but consist of lithic or uric acid combined with soda, forming what the chymists term the lithate or urate of soda. These concretions occur principally about the joints of the toes and fingers, in little nodules, which Sydenham compares to crabs' eyes; but sometimes they appear about the larger joints, where they occasion a whitish swelling almost as large as an egg, which becomes gradually inflamed and red. There is an instance of a very large concretion of this nature, recorded in the surgical works of Sir E. Home. But perhaps the most curious case is that related by Mr. Watson: the patient, who was a martyr to gout, had so extensive a deposition of urate of soda, that the concretions not only enveloped the joints of his great toes, formed tumours on his legs, and

rendered the synovia of the large joints as thick as cream, but "the joints of the fingers were swelled and knotty, every knot being a lump of chalk; and I was told (says Mr. Watson) that, when he played at cards, he used frequently to score up the game with his knuckles."* It is singular that our author, with his very extensive information on all subjects connected with medical science, should have fallen into the error of describing gout-concretions as really composed of lime.]

It seems probable, that urate of soda has sometimes been thrown off by the skin. I have seen, says Swediaur, an inveterate case, in which the patient, labouring under a paroxysm of several months' duration, had the entire surface of the body covered every morning with a white powder, as though he had been dusted with flour.—(*Nov. Nosol. Meth. Syst.*, i., p. 218.)

Thus far we have followed up the progress of a regular attack of gout in a constitution otherwise healthy and vigorous. But the same diathesis exists in systems of delicate and infirm health, and where there is a want of sufficient energy to work up a fit of inflammation, and throw it off at its appropriate outlets. And in such case, as soon as it becomes roused into action by any of the causes of excitement already enumerated, it constitutes the SECOND VARIETY, assumes the guise of various other diseases, as dyspepsy, hysteria, hypochondrias, palpitations of the heart, vertigo, hemicrania, with several modifications of palsy or apoplexy. The stomach and bowels, however, form the chief seat of affection; the appetite is fastidious or destroyed; a spasmodic stricture or painful oppression is felt in the epigastric region, or the stomach is distended almost to bursting with flatulence; nausea, eructations, vomiting, and all the symptoms of indigestion follow, and are alternated with severe colic or costiveness. In the meanwhile, the disease shows itself, at times, in one or more of the joints, in slight and fugitive pains, as though making an ineffectual effort to kindle up a paroxysm of proper inflammation, but which there is not energy enough in the system to accomplish; whence the articular pains cease almost as soon as they appear, and the visceral derangement is renewed; sometimes slowly subsiding after a continuance of several weeks, and sometimes wearing out the entire frame, and terminating in abdominal or cellular dropsy.

It sometimes happens, however, that while the general constitution of a podagric patient is tolerably sound, one or more of the internal organs form an exception to the general rule, and are less healthy than the rest. And as, upon an excitement of gouty inflammation in a gouty habit, the inflammation seizes ordinarily upon the weakest part of the body, it makes its assault upon such organ rather than upon the hands or the feet; or, if it commence in the latter, is readily transferred to it; constituting the THIRD OF THE VARIETIES before us, and which has usually been called RETROGRADE or MISPLACED GOUT. And if the general system should at the same time be below the ordinary tone of health, when the paroxysm is thus excited by the force of some occasional cause, the organ affected may evince great languor and painful inertness, as in the second variety, rather than acute inflammation, as in the first. The sensation in the stomach, instead of being that of a fiery coal, is that of a cold lump of lead; in the head, it changes from maddening pain to oppressive horror, in which the patient suddenly starts from sleep almost as soon as he has begun to doze, from the hideousness of the ideas that rush across the mind and form the distracting dreams.

The fit is sometimes transferred to the bladder; in which case, there is acute pain at the neck of the organ, strangury, and a discharge of thin acrid mucus from the urethra.* The rectum has also been occasionally the seat of metastasis, and has evinced various species of affection, as simple vehement pain, spastic constriction, or hemorrhoidal tumours. When thrown upon the lungs, it mimics the symptoms of a peripneumony.

[The following observations by Dr. Bateman appear valuable. Many errors have probably been committed, in considering almost every species of indisposition that occurs in gouty habits as arising from the gouty diathesis. We remember to have heard this point strenuously insisted upon by the able Professor of Physic in the University of Edinburgh, Dr. Gregory. Many of the symptoms above enumerated are obviously connected with the impaired functions of the stomach, and occur in dyspepsy or indigestion. Such are various hypochondriac sensations; the palpitations of the heart, often proceeding from over-distention of the stomach with flatus, by which the heart is mechanically pressed upwards; cramps in different parts of the body, which are often relieved by a discharge of wind of the stomach: difficulty of breathing, often arising from the distention of the stomach, which impedes the descent of the diaphragm; and the headache, giddiness, &c., which are daily observed to be connected with

* See Medical Communications, vol. i., art. 3. Two or three years ago, the editor saw a lady in the Fleet Prison, not more than thirty years of age, and the mother of several children, who was in such a state from deposites of urate of soda around almost all her joints, that her limbs were of little or no use to her. She had resided a considerable time in France; but had always been abstemious in her mode of living. When her knees were bent and extended, a rattling noise was produced, like what would arise from shaking a bag of marbles.—Ed.

* "Not unfrequently there is a nephritic attack; an attack of inflammation of the kidneys, and a deposition of lithic acid, or some compound of it. Occasionally these things take place with the gout; occasionally they take place only during the intervals; but a deposition in the urine, and a fit of gout, where there is deposite in the joints, are frequently very closely connected."—Professor Elliotson's Lectures, see Med. Gaz. for 1833, p. 822.—Ed.

impaired digestion. On the other hand, inflammatory disorders of the lungs and other viscera, congestions in the head, inducing headache, somnolency, vertigo, &c., and ultimately various degrees of paralytic and apoplectic disease, not essentially different, in any respect, from the same affections in habits free from a gouty diathesis, have probably been suffered to go on, and to prove fatal, under the notion that they were gouty, and the proper remedies have been therefore neglected.*]

In applying the art of medicine to the cure or alleviation of gout, our attention must be directed to the state of the patient during the paroxysms, and during their intervals; and particularly to the state of his constitution or previous habits, which, according to their character, may demand a different and even an opposite mode of management.

Let us commence with the PAROXYSMAL TREATMENT; and, first of all, with that of the inflammatory attack, as it shows itself in a regular fit of the disease.

It was formerly the belief, as we have already seen, that a gouty paroxysm was an effort of nature to throw off from the constitution, and thereby restore it to a state of perfect health, some peccant matter forming the proximate cause of the distemper; and it was hence also conceived in addition, to adopt the language of Sydenham, that the more vehement the fit, the sooner it would be over, and the longer and more perfect the intermission. And, in this view of the subject, there can be no question, that the wisest plan must have been that of leaving the paroxysm to run through its regular course without interruption. Yet, as this hypothesis has long fallen into discredit, we are not in the present day prevented, on such ground, from endeavouring to subdue the inflammation of a gouty paroxysm by the ordinary means resorted to in inflammations of any other kind, as bleeding, purgatives, sudorifics, local astringents, and even refrigerants. But a very general objection has since been taken to this plan on another ground; and that is, the great danger of repelling the disease to some internal organ of more importance, and thus of converting a regular paroxysm into a case of retrograde or atonic gout. And, in consequence of this apprehension, the practice, even in the hands of many of our most celebrated physicians, has, for a long period, been in the highest degree vague and vacillating. Sydenham prohibited equally purging and sweating of every kind, whether gentle or copious, and only allowed bleeding where the patient was young and vigorous, and on the first or second paroxysm: while of cold applications he takes no notice whatever. He admits, however, the use of laudanum where the pain is very acute: trusting chiefly for the cure of the disease to an alterant regimen and apozems to be resorted to in the intervals. Dr. Cullen allows bleeding with the same restriction as Sydenham, though he recommends the application of leeches to the inflamed part, as at all times a safer practice than the use of the lancet. Of cathartics and sudorifics he takes no notice, otherwise than as these may enter into the general course of antiphlogistic regimen; he is decidedly adverse to the use of cold; and thinks that warm bathing and emollient poultices, blistering, burning with moxa, camphorated and aromatic oils, induce the inflammation to shift from one part to another, and consequently tend to repel the inflammation from the extremities to some more important organ: while opium, though it affords relief in present paroxysms, occasions them to return with greater violence; and therefore he observes, by way of conclusion, "The common practice of committing the person to patience and flannel alone, is established on the best foundation."—(*First Lines of the Practice of Physic*, aph. DLXIX.)

Now, as we have already seen that the gout, after it has shown itself in paroxysms, is never idle; that one paroxysm, in the opinion of Sydenham, Cullen, and every other physician, hastens on another, renders its intervals shorter, and its durations longer; and progressively saps all the energies both of mind and body, and renders life itself a burden; it is of serious importance to inquire, whether this fear of a repulsion, however well founded in some instances, be not allowed too generally? whether it be not possible to draw a definite line between the form of the disease in which it ought to operate, and that in which it ought not? and whether in the latter case we may not derive all the benefit from a full use of a reducing process, which is obtained in other inflammations accompanied with a like degree of constitutional vigour?

From the history of this disease, as it has already passed before us, we may draw this general corollary; that the specific inflammation of gout, or whatever other morbid character it may evince, when once excited by some occasional cause into action, has a peculiar tendency to fix and expand itself upon the weakest parts of the system, and, where several parts are equally weak, to pass in sudden transitions from one part to another, though transitions are rare where the system is sound.

In healthy constitutions, the weakest parts are the extremities; and hence, in such constitutions, these are the parts, as we have already seen, in which the gout uniformly opens its assault. Here it commences, and here it runs through its course, seldom migrating, or, when

* See Bateman in Rees's Cyclopædia, art. GOUT. In this view Dr. Barlow also concurs. "A paroxysm of gout," says he, "can be regarded only as a constitutional disturbance of an inflammatory character, attended with local inflammation of a peculiar kind, in one or more joints, running a determinate course, and, in the earlier accessions, terminating in health for the most part, within a very few days. Such being the character of simple gout, there is no reason why the complications so much dwelt on should be considered as specially belonging to it, or regarded otherwise than as accidents arising from peculiarity of constitution, contingent derangements of health, or the lesions or morbid tendencies entailed by preceding accessions."—See Cyclop. of Pract. Med., art. GOUT.—ED

it does migrate, only passing from one extremity to another: as from foot to foot, or one of the feet to one of the hands; and limiting itself to these quarters, because they are the weakest parts of the system.

In unhealthy habits, however, the extremities are not the weakest parts of the system, but perhaps the stomach, or the heart, or the head, or the lungs, or some other organ; while several of these organs may, moreover, be equally debilitated, according to the idiosyncrasy, or to accidental circumstances. And, true to the general rule, we see the gouty principle, when roused into action in habits of this kind, fixing itself from the first on one of those important viscera, rather than on the extremities; or roaming from one to another, on its alternating its course from these organs to the extremities, or from the extremities to these organs. And as metastases are rare where the system is sound, they become frequent in proportion as it loses this character, and especially in proportion to its debility in particular parts.

These are rules which we cannot too closely study and commit to memory, and they seem to point out to us the line of distinction between that form of the disease in which we ought to entertain a prudent fear of revulsion, and that in which we may safely act without any such fear whatever. They directly lead us to two states of constitution that require a very different, and in many instances a very opposite mode of treatment; and seem to settle the important question before us, under what circumstances it may be expedient to employ a palliative plan, and under what a cooling and reductive?

Let us commence with the first of these two states, forming a regular but violent fit of gout, as it shows itself in a sound constitution, and inflicts its torture on the hand or the foot. Guiding ourselves by the laws just laid down, there seems no reason why, instead of "committing the person to patience and flannel alone," we should not pursue the evacuating and refrigerant means employed in entonic inflammations of any other kind, and have cause to expect a like success; such as bleeding, so strongly recommended by Dr. Heberden, and allowed occasionally by Sydenham, and emptying the bowels, relaxing the skin generally, and cooling the fiery heat of the affected limb by cold water or any other frigorific application.* With a transfer of morbific matter we have now no longer to contend. Yet, even where such a cause is admitted, as in most exanthems, the plan thus proposed is, in many instances, pursued without hesitation. Thus, in measles, cathartics and venesection are not only in general use, but often indispensable; in the height of malignant scarlet fever, we sponge or wash the entire surface of the body with cold water; and in small-pox, not only purge freely, but expose the patient to the coldest atmosphere of the winter season.

In weakly habits or idiosyncrasies, or incidental debilities of particular organs, we have admitted that a metastasis, as we have already seen, is a frequent result, and peculiarly marks the character of gouty inflammation; and here, indeed, refrigerants, violent purgatives, and venesection ought to be most sedulously abstained from; and not unfrequently, the best practice we can adopt is that of "committing the person to patience and flannel alone." But what I am anxious to establish is, that, agreeably to the laws which regulate the progress of gout, a metastasis in sound and vigorous constitutions is rarely to be expected, and perhaps never takes place except from one extremity to another. In order that some internal organ may become the seat of transferred gout, it is necessary that it should possess a weaker action than the part from which the inflammation is to be transferred: but the parts of weakest action in a sound and vigorous constitution are the extremities themselves; and it is probably because the living energy is, in all the extremities, upon a balance, that in a sound frame a metastasis, even from one extremity to another, is a rare occurrence.

[In the foregoing argument, the doctrine that the weakness or weak action of any part is what disposes it to be affected by a metastasis of gout, is only asserted, and by no means proved. The abundance of fibrous and ligamentous structures about the foot and hand may seem to many pathologists a better reason for these parts being so disposed to gouty inflammation, than the hypothesis of weakness.]

As far as I have seen, the inflammation of a regular fit of gout subsides gradually, though rapidly, under the treatment now proposed, without any repulsion whatever. In a few instances, during the use of a cold pediluvium, or shortly afterward, I have known patients speak of a peculiar kind of *aura* creeping over them and through them, and exciting an undefinable sense of glowing, which has lasted for a few minutes, without any inconvenience at the time, or even any change in the pulse; and certainly without any ill effect afterward.

But, it may be replied, there is no resisting facts. The cases are innumerable in which great mischief has resulted from the depleting and the refrigerant plan; and, as we cannot

* "In simple gout, we know of no good reason why the treatment applicable to the same degree of general fever and local inflammation, occurring from other causes, should not be employed: its general safety and efficacy we can faithfully attest, nor are we aware of any peculiar caution being required beyond what the accompanying state of the constitution and the attending symptoms must necessarily suggest. In all diseases, however inflammatory, the state of the constitution requires to be taken into account in judging of the activity of practice that may be safely ventured on; and the same consideration is needed in gout; but, assuredly, none is due in this respect to the imputed essence of gout, nor to the apprehension of interfering with it, which has been too long suffered to paralyze the efforts of the practitioner."—Dr. Barlow in Cyclop. of Pract. Med., art. GOUT. These sentiments should never be forgotten with reference to the treatment of gout; and they seem to the editor to be supported both by reason and experience.—ED.

always tell that all the internal organs are or are not in a state of sound health, it is most prudent to abstain from a practice which may prove highly injurious in case of a mistake.

The answer to this remark is, that here, as well as in every other disease, professional judgment is to be called into exercise, and the practitioner is to draw largely upon that skill and discrimination which it was the object of his education to bestow upon him: and thus bestirring himself, he will rarely fall into an error. That mischief has resulted, and frequently, from the use of the plan before us, cannot be denied by any one; but that great and essential good, and an easy and rapid cure, have been also in hundreds of instances effected, must be admitted as readily. No clear distinctive line, however, has hitherto, so far as I am acquainted with, been acted upon, or even laid down; and hence it is rather to be ascribed to a want of discrimination upon this subject that the evils adverted to are chargeable, than to any mischief in the plan itself. Yet it may be doubted whether the injury produced, even by an injudicious use of evacuants and refrigerants, amounts to a thousandth part of that entailed on the constitution by allowing the gout to make its inroads tacitly and unresisted; till by degrees it triumphs equally over all the powers, as well of the body as of the mind, and, in the forcible language of Sydenham, "The miserable wretch is at length so happy as to die."*

Of the benefit produced by the external use of cold water, the author can speak from a trial of several years formerly upon his own person, and is only anxious that others should participate in what has proved so decisive a comfort to himself. It is his duty to state, however, that, apparently owing to too much exertion of mind in the composition of this work, the gout has since appeared, accompanied with a more irritable state of the general frame than had hitherto been manifested. On this last occasion, therefore, he did not venture upon the cold bath, but confined himself chiefly to the wine of colchicum, with very frequently a full dose of magnesia; and, by this simple plan alone, he has again been able to obtain a restoration of health, and the full enjoyment of foot-exercise.

Yet the bolder practice before us is by no means of modern invention, however it may have become a subject of warm controversy in the present day. An active evacuant plan, both by venesection and purging, has never ceased to be in use among many practitioners, and is particularly alluded to by Sydenham, though with a view of entering his protest against it, as injurious to a free discharge of the peccant matter, which, in his opinion, required to be carried off; while, with respect to the external use of cold water, not to mention that it seems to be alluded to by several of the Greek writers, and especially by Hippocrates (*Aphor.*, sect. v., p. 25), it has descended in a stream of recommendations from Zacutus Lusitanus (*De Medicorum Princip. Historiâ*, lib. iii., Amsterd., 1641), in 1641, to Kolhaas (*Baldinger, Neuer. Mag.*, band. v., p. 521, 1788), and Keck (*Abhandlungen und Beobachtungen*, Berl., 1789), in 1788 and 1789. Bartholin speaks of the use of snow as a common application in 1661 (*De Usû Niviz medico*, 1661, 8vo.), and Pechlin both of snow and cold sea-water towards the close of the same century.—(*Observ. Physico-Med.*, Hamb., 1691, 4to.)

But this treatment, I am ready to admit, has often been employed rashly, and sometimes with great and even fatal mischief. It ought never to be ventured upon except, as already stated, where the constitution is decidedly sound and vigorous; for, though I subscribe to much of Dr. Kinglake's therapeutic plan, I cannot agree with him that a gouty paroxysm is a merely local affection. The treatment before us should be limited to those who are in full vigour, and perhaps entony of health; and is especially to be avoided where the stomach is dyspeptic, the lungs asthmatic, the heart subject to palpitation, the head to nervous pains or drowsiness; or where there is any known disability in any other important organ.*

Yet even here we need not, I think, condemn the sufferer to the torture till cured by patience and flannel; for it will often be in our power at least to palliate his pain, and not unfrequently to expedite his cure, without any risk whatever of affecting his general state of health. Leeches may, in many instances, be applied where venesection would be of doubtful expediency; a liniment of oil of almonds, impregnated with opium, rubbed on the tumefaction with a protracted and very gentle friction, I have often found highly serviceable in mitigating the pain; and epithems of tepid water,

* "If the character of gout, in its simplest form and highest intensity," as Dr. Barlow remarks, "be unequivocally inflammatory, it is difficult to conceive why its various shades and modifications should be otherwise regarded. The differences are not greater than are continually met with in several other diseases; nor, when they do occur, is there any difficulty in referring the peculiarities to the particular constitution, the effects of previous disease, and other contingent circumstances, amply sufficient to account for them. These circumstances may, and in numberless instances do, require that the appropriate remedies of inflammation should be applied with caution, but they can by no means warrant the principles of treatment founded on the inflammatory nature of gout being wholly reversed, as is too often witnessed. There has been too much disposition, arising from timidity, ignorance, and false theory, to transfer to simple active gout the cautions and the apprehension of interference, which the contemplation of the complex and less active modifications has given rise to." In the correctness of these observations the editor fully concurs: the principles here inculcated ought to have their proper weight in the practice of every man who wishes to treat this disease with success.—Ed.

* Though Dr. Elliotson approves of the use of a spirituous tepid lotion, he thinks that no medical practitioner is justified in recommending cold applications, as they may bring on apoplexy, violent gastrodynia, or an affection of the heart, and the speedy death of the patient.—See Lectures in Med. Gaz. for 1833, p. 851.

as recommended by Dr. Scudamore, alone or mixed with a portion of ether or alcohol, formed by cloths wetted with the fluid, and applied to the inflamed part, renewable as they become dry, in many cases prove a grateful substitute for cold water; and are preferable to poultices, warm water, or even vapour-baths, which too generally relax and weaken the joint, and prevent it from recovering its elasticity, after the paroxysm is over, so soon as it otherwise would do.

At the same time, the body should be cooled with gentle aperients or injections; and, while drenching sweats are avoided, which never fail to be injurious, the breathing moisture or diapnoë should be imitated, which often breaks forth naturally in an early part of the morning, and is sure to afford relief after a night of distraction. Nor should opium be omitted where the pain is very acute; for, while it affords temporary ease, it diminishes the duration as well as the violence of the paroxysm. Dr. Cullen, in his Practice of Physic, seems disposed to postpone the use of this medicine till the paroxysms have abated in their violence; for, when given in the beginning of gouty paroxysms, he asserts that it occasions the fits to return with additional fury. Yet, it should never be forgotten, that it is a law in the history of gout, and one to which we have already adverted, that the frequency and vehemence of the ensuing paroxysms are measured by the violence of those that have preceded.

In the meantime, the regimen should be light and unirritant, and the diet below the standard to which the patient has been accustomed; though, to guard against a metastasis to the stomach, we must be cautious that we do not reduce it too much. His beverage should be cool and unstimulant; Sydenham allows him sound table beer, and, if he have been accustomed to stronger malt liquors, such a drink may be conceded to him. His chamber should be well ventilated, and his dress light and easy.

In the two ensuing varieties, constituting atonic and retrocedent gout, we have a podagric diathesis grafted upon an unsound frame; the unsoundness being general or local: and, however fearless we may be of the disease fixing on any internal organ in the preceding variety, we have here a constant apprehension that it may do so, and, in many cases, see it commence in such organs.

In atonic gout, our uniform attempt should be to produce a transfer from the part on which it has seized, and fix it in the extremities: in retrocedent gout, on the contrary, to render the vacillating attack on the extremities more permanent, and prevent it from shifting to any other quarter.

To obtain the first intention, we have to strengthen, and even stimulate the system generally, by warm tonics and a generous diet, and, above all things, to take off the severe suffering, in whatever it may consist, from the affected organ; for the longer the fit continues there, the weaker the organ will become, and the less capable of any instinctive remedial exertion. At the same time, we may solicit the paroxysm to the extremities by putting the feet into warm water.

In atonic gout, the sufferings, though widely different, according to the seat of the disease, are almost insupportable. In the head the pain is maddening, or the disorder is accompanied with great horror, or mimics the stupor of an apoplexy: in the stomach there is a faintness like that of death, with the sense of a cold lump of lead lodged within it; or there is a gnawing or a burning agony, or a spasmodic stricture which cuts the body in two, and renders breathing almost impossible; often also accompanied with a rapid and sinking palpitation of the heart.

It is of importance, before we proceed, to determine accurately that these anomalous symptoms are really those of gout; of which we have chiefly to judge from the general character of the patient's constitution, his hereditary predisposition, habits of life, and the ailments to which he has been previously subject. In most cases during the paroxysm, and especially where the stomach is affected, the warmest cordials are necessary, as brandy, the aromatic spirit of ammonia, the tincture of ginger or of capsicum, or, what is still better, usquebaugh. And it is always advantageous, and especially where the bowels are confined, to add to it some warm aperient, as aloes or rhubarb. Most of our family gout-cordials are made upon this principle, and judiciously consist of some active aperient, and the hottest aromatics dissolved in ardent spirits. And the patient who is subject to these attacks, should never be without having something of this kind at hand, since the paroxysm often makes its onset without any warning. Yet he should resolutely forbear having any recourse to any such medicine, except in the time of necessity; for an habitual indulgence in any of them will still farther debilitate the affected organ, and indeed the entire system; and hence quicken the returns of the paroxysm, and render the stimulant antidote less availing. The best aperient, and at the same time stimulant medicine that I know of for this purpose, is the essential oil of turpentine; which, as uniting the powers of an active cathartic and a camphorate cordial, gives us all the qualities we are looking for. I do not know that this valuable medicine has ever yet been brought into general practice in any form of gout; but I may venture to predict, that those who try it, in the modification before us, will seldom have to repent of their experiment. The dose should be about six drachms, swallowed unmixed.

Most of the preparations of ether contained in the current Pharmacopœia of the London College, may be employed with benefit in the variety before us, and particularly in that icy coldness of the stomach, accompanied with a numbness of the limbs and a rapid palpitation of the heart, under which it occasionally exhibits itself. Phosphorus itself has sometimes been ventured upon in this case, in the proportion of two or three grains to a dose, dissolved in turpen-

the proportion of ether; but I have never employed it, and cannot speak of its good effects. Musk seems, in many instances, to have been of decided advantage, if given in sufficient doses, as well in gouty affections of the head as of the stomach. The case related by Mr. James Pringle is strikingly in its favour (*Phys. and Lit. Essays*, vol. ii., art. xii.), and seems to have induced Dr. Cullen to make trial of it in similar instances, who found it produce sudden relief, by free doses repeated after short intervals; and this where the lungs, as well as the head and stomach, were the seat of transferred disease.—(*Mat. Med.*, part ii., ch. viii.)

External irritants may also be beneficially employed at the same time, and particularly those of rapid action, as the compound camphire liniment, sinapisms, and the burning of moxa, or coarse flax, as recommended by Hippocrates: at the same time the extremities, as already advised, should be plunged in the warm bath.

But our sheet-anchor is opium; and it should be given freely, and in union with some preparation of antimony, so as to act towards the surface generally, and thus restore to the living power its interrupted equilibrium. Small doses of opium will here be of no avail; and we may generally repeat or increase the quantity to a large amount with perfect safety. "In a case of the gout in the stomach," says Dr. Cullen, "I have by degrees gone on to the dose of ten grains twice a day; and, when the disease was overcome, the dose of opium was gradually diminished, till, in the course of two or three weeks, it was none at all: and in all this no harm appeared to be done to the system. We frequently find that when a strong irritation is to be overcome, very large doses may be given without procuring sleep, or showing any of those deleterious effects that, in other cases, appear from much smaller quantities. All this appears from the practice now well known in tetanus, mania, smallpox, gout, and syphilis."—(Id., part ii., ch. vi.)

In retrocedent gout, the same plan is to be pursued where the attack has actually shifted from the feet or hands to some internal organ. But where it still lingers in the extremities, though with slight pain and inflammation, and frequent cessations, as though it were on the point of removal, we should increase the morbid action by local irritants applied to the joint, as camphire, ammonia, blisters, sinapisms, or the moxa; and at the same time prescribe a light, but generous diet, with rather more wine than the patient is in the usual habit of taking; carefully avoiding all violent cathartics, and keeping the bowels moderately open with rhubarb, aloes, or the compound colocynth pill.

In gout, however, the INTERVALS OF THE DISEASE are of as much importance to be attended to as its paroxysms: and here, also, the mode of management under the first form should differ essentially from that under the second: for, though the occasional causes may in many cases be the same, they have in the former to operate upon a vigorous, perhaps upon an entonic scale of power, and in the latter upon a scale decidedly reduced and atonic.

In every variety, all known occasional causes must be equally avoided. Where the diet has been too rich it must be lowered, and where too spare and abstemious, made more liberal. Indolence and a sedentary life must give way to regular exercise; and over-exertion of body or mind, to repose and quiet. In the young, robust, and corpulent, whether the disease result from too great indulgence at the table, or an habitual taint, it may be requisite to abstain from animal food, wines, and fermented liquors, altogether; but where the sufferer has passed considerably beyond the zenith of life, and the luxuries of the table have become habitual, his ordinary fare should be reduced or diminished, rather than entirely commuted. And, in every change, it is better to proceed slowly, than to rush rapidly from one extreme to another: since nothing has so great a tendency to prepare the internal organs for gouty paroxysms, as such sudden and violent transitions. The bowels should be kept in regular order, and the hour of rest be early.

A due and unswerving attention to these general rules of the hygiene will often be sufficient to keep those free from all disturbance of the gout for many years, and perhaps for the whole of their subsequent life, who have only known it in the form of a few regular paroxysms. But where the system, and especially the digestive function, are weak, and the patient has had anticipations of atonic or recedent gout, or has actually suffered from its assaults, it will be necessary to superadd a course of INVIGORATING MEDICINES.

There are three classes of remedies that generally pass under this name; stimulants, bitters, and astringents. The first increase the action, the two last augment the tone. Stimulants can rarely be employed alone, except in cases of emergency; for a lax state of fibres will bear little increase of action, without, at the same time, suffering an equal increase of debility. But they may often, and in the case of gout perhaps always, be combined with astringents and bitters with great and decisive benefit. Upon this subject, however, I have already treated so largely under LIMOSIS DYSPEPSIA, OR INDIGESTION, that it is only necessary to refer the reader to that part of the work for the present purpose.

Most of the celebrated specifics for preventing a return of gout have been formed of these classes of medicines in combination, and especially of bitters and aromatics; and it is singular that, although the variety of them which nature offers to us is almost infinite, they have been employed with little change from the time of Galen and Cœlius Aurelianus in the second century, to that of Sydenham in the seventeenth. The famous powder purchased by the second Duke of Portland, who distributed its receipt for general use, from the service it appeared to have rendered him, is formed for the most part of the very same ingredients, modified either from the Greek writers, Cœlius Aurelianus and Ætius, or from Dr. Sydenham's

prescription; though it is a simplification of the latter, by omitting several of the articles that enter into his composition, one or two of which had better be retained. In this reduced form, it consists of equal parts of the five following materials, finely powdered and intimately commixed: birth-wort, gentian, germander, ground-pine, and the tops and leaves of the lesser centaury. The dose is a drachm taken fasting every morning for three months; after which it is to be reduced to three quarters of a drachm for three months longer; then to half a drachm for the remainder of the year; and, after this, the same dose is to be continued every other morning only, through the next twelve months: by which time it is presumed that a cure will be accomplished.

The real effect of this and similar medicines is very doubtful, and the doubt arises from the gradual mischief which a gouty diathesis has a tendency to produce in the corporeal system; and the benefit which the exact and abstemious regimen that is prescribed during the use of the Portland or any other course of bitter tonics, is calculated to afford of its own accord. In some instances, such medicines seem to have produced little or no effect of any kind: in others, the joint result of remedy and regimen seems to have been highly salutary; while, in others again, the patients, though free from open and decided fits of the gout, appear to have sunk gradually under complaints more distressing and fatal than the gout itself, as dyspepsy, lowness of spirits, and dropsies of almost every part, especially hydrothorax, ascites, and anasarca.

Now, it is possible that the regimen alone may have produced the good where good has been experienced, and the gouty diathesis the evil, where evil has followed; or that the bitter tonics themselves may have done both, according as the individual to whom they have been administered has been in a proper or improper state of body for a trial of them. They are not to be used indiscriminately; for, while the relaxed and debilitated, those who are subject to atonic and retrocedent gout, may have recourse to them with great advantage, they will be sure to prove injurious to those of high entonic health, and who are distinguished by attacks of gout in regular but vehement paroxysms.

Some bitters, even among those in common use, may possess more of the sedative and narcotic principle than others; and, where this is the case, though such may be fittest for employment in the first instance, they ought to be dropped for others of a different kind, as orange-peel, bark, columbo, and serpentaria, as soon as all local irritation has ceased. The strongest bitter we are acquainted with is the *nux vomica*, and the narcotic quality of this is known to every one. Opium possesses it in a still higher degree. It has of late been suspected to exist in wormwood, and been distinctly traced in the hop and some of the lettuce tribe.

Dr. Cullen, however, has taken a different view of this subject. He supposes all bitters to possess a deleterious quality of some kind or other, and that, in all gouty persons, they have a power of warding off fits of this disease; but that, from this deleterious property, when long persevered in, they weaken the stomach and other organs of digestion to which they at first gave tone, and thus ultimately induce the diseases we have just noticed, and which are too apt to follow upon a debility of these viscera. And, in proof of this opinion, he tells us of the fate of nine or ten persons who had been liable for some years before to have "*a fit of a regular or very painful inflammatory gout*, once, at least, and frequently twice, in the course of a year; but who, after they had taken the Portland powder for some time, were quite free from any fit of inflammatory gout," and, having completed the course prescribed, "had never a regular fit, nor any inflammation of the extremities, for the rest of their life. In no instance, however," continues Dr. Cullen, "that I have known, was the health of these persons tolerably entire. Soon after finishing the course of their medicine, they became valetudinary in different shapes, and particularly were much affected with dyspeptic, and what are called nervous complaints, with lowness of spirits. In every one of them, before a year had passed, after finishing the course of the powders, some hydropic symptoms appeared, which, gradually increasing in the form of an ascites or hydrothorax, especially the latter joined with anasarca, in less than two, or at most three years, proved fatal."—(*Mat. Med.*, part ii., ch. ii.)

As Dr. Cullen gives us no account of any mischief that has followed the use of bitter tonics in constitutions marked by general debility and atonic gout, the evils he has described seem, on his own evidence, to be limited to those whom we have already cautioned against the employment of such a course. No proper classification or line of distinction seems to have been drawn or adhered to; which would probably have presented us with very different results if it had been, and have superseded the clashing and unsatisfactory explanation of atonic effects uniformly produced by a continuance of tonic medicines.

The subject, however, requires to be further examined by a more accurate classification of gouty patients who may be put under the influence of medicines of this kind; and I throw out the hint for this purpose. Yet, that a persevering course in bitter tonics does not uniformly prove in any way injurious to those who engage in it, is, I think, demonstrable from the daily use of table beer in almost every family throughout the country, and its appearing to be one of the wholesomest beverages we can adopt. Dr. Darwin, indeed, ventures to ascribe part of the mischief produced by highly-spirited malt liquors to some noxious quality in the hops they contain; but the stronger and headier malt liquors are uniformly prepared with a much smaller proportion of hops than the weaker, and especially than those which go under the name of table beer. For the only point aimed at by the employment of hops is to prevent an acetous fermentation, which is effectually guarded against by the larger proportion of spirit con-

tained in ale and strong beer, but which every one knows would soon take place in table beer if it were not powerfully impregnated with this grateful bitter. And hence the remark of Dr. Darwin seems to have no foundation whatever, since the stronger bitter affords a beverage proverbially wholesome, while the weak bitter is that which proves injurious.

There have also, in all ages, been offered to the public specifics for the sudden cure or removal of the paroxysm when present, as well as for preventing its return hereafter. Lucian, in his Tragopodagra, gives us, with great humour, a list that occupies a page, of such as were chiefly in vogue in his day; and the catalogue is certainly not diminished in our own. Those that have acquired the highest reputation appear to have been composed of some species of hellebore, or of meadow-saffron; the first of which is among the remedies quoted by Lucian; though it is probable that the ῥίζαν ΕΛΛΕΒΟΡΟΥ of the Greeks was a different plant from either the white or black hellebore of modern dispensatories.

The favourite specifics of the present day are M. Husson's Eau médicinale, and the vinum colchici, or wine of meadow-saffron. The exact components of the former are kept a secret; though its basis is well known to be either the one or the other of the above plants, most probably the meadow-saffron. The effects of the Eau médicinale and of the colchicum wine do not essentially differ; for, after taking about sixty drops of either, the pulse becomes slower, and at length sinks, in about twelve hours, from ten to twenty strokes in a minute below its natural number, at which time the inflammation subsides. The action of both medicines is accompanied with great languor and a deadly nausea or sickness, which terminates in vomiting, or a discharge from the bowels, or both. If the dose be in a small degree in excess, the symptoms are syncope, cold sweat, extreme prostration of strength, violent vomiting and purging, a wiry and almost imperceptible pulse, or a state of utter and very alarming insensibility. And, in some constitutions, these effects have followed from the use of even a common dose.

Sir Everard Home made several trials of the colchicum wine on a dog, both by the stomach and by infusing it into his jugular vein. From thirty drops he recovered in about seven hours; from sixty drops, in eleven; but a hundred and sixty drops, thrown into the jugular vein, killed him, after having suffered great agony, in five hours. On opening him, the stomach, smaller intestines, and colon, were highly inflamed.—(*Phil. Trans.*, 1816, art. xii., xiii.) And it is hence obvious that this medicine, like many other emetics and cathartics, acts rather upon the stomach through the medium of the circulation, than on the system through the medium of the stomach. It is possible that the colchicum may act by a specific power on the peculiar inflammation of a regular fit; yet, as other intestinal irritants have occasionally produced a like effect, and particularly the *gratiola officinalis* (hedge-hyssop), and *ranunculus flammula*, the disappearance of the paroxysm may also be ascribed to a transfer of action to the stomach and intestines. Generally speaking, specifics operate by a secret and inexplicable power, as the bark in intermittents, the vaccine virus in shielding the constitution against smallpox, and mercury in syphilis: for, though a ptyalism gives proof that the system is impregnated with the last, there are few practitioners so attached to the Cullenian doctrine in the present day, as to contend that the venereal virus is carried off by the salivation, since we are perpetually beholding it carried off under the influence of mercury without any salivation whatever.

Yet, admitting that the colchicum has a specific power over a regular inflammatory paroxysm of gout, it is clear that it has no such power over the gouty diathesis, since the paroxysm has never been so removed as not to return again. And it hence becomes a serious question, whether the mischief produced in the constitution by the employment of so active a medicine, in the large doses recommended by some practitioners, be not greater than the temporary good obtained by the suppression of the inflammation?

From the rapidity and force of the operation, it is clear that they ought never to be tried, or never without the utmost caution, except in the first variety of gout, or where the system is firm and healthy, and the disorder shows itself in a regular fit. And as it is highly desirable, for reasons already stated, to restrain the violence of the paroxysm, shorten its duration, and carry it off as soon as possible, the use of the one or the other of these medicines may be judicious, so long as the system is able to recover itself with speed from their influence, and provided the patient limit himself to the smallest dose that will answer the purpose.

Yet these medicines, from too little attention to their real effects, and from a mistaken idea that they are equally a specific for gout under every form, have not often been confined to the entonic variety, nor employed with sufficient discrimination in the second and third varieties of the disorder, in which the system, and particularly the digestive organs, are in a state of chronic debility; and the inflammatory fit, when it shows itself in the hands or feet, is incomplete and evanescent. In all such cases, such medicines, without the superintendence of much practical caution and judgment, cannot fail to do serious injury to the constitution. They have a tendency to increase the ventricular weakness, and hereby to leave the system more open to all the miseries which gout is so perpetually entailing. And hence the reason of the very general complaint among those who have tried these remedies, that, although they remove the fit at the time, they shorten the intervals, and render their frames more obnoxious to relapses. In my own person, I have never exceeded forty drops of the colchicum wine, prepared after the form of the Royal College; and I have seldom failed to find this serviceable, though I cannot affirm that it has been uniformly so.

The remarks of Dr. Lucas upon this subject are well worthy of attention, and, as being offered since the first edition of the present work, may be quoted as confirming the author's views. Having contended for a specific principle in gout, which he thinks obvious from the peculiar acid smell of the perspiration, and the deposite of urate of soda concretions, he proceeds as follows:—"I am much strengthened in this opinion by the effects of the Eau médicinale and other gout medicines of the day in procuring summary relief in the first instance, at the expense of more frequent visits of the disorder, till at length it is constantly present, and in some form or other proves fatal. The inflammation here is probably cured before the morbid matter can be thrown off, which, therefore, shortly renews its attack, while the powers of the constitution generally give way under this unsuccessful conflict: for it does not appear how the cure of inflammation, abstractly considered, can be too rapid, if effected with safety to the organization."—(*On the Principles of Inflammation and Fever*, 8vo., 1822.) It hence follows, as already observed, that our great object in the employment of these medicines should be to moderate the inflammation, without trenching on the strength of the constitution.*

Where the inflammation has subsided, and weakness alone remains, and an inability to use the limb without pain, I have at times found the support of a compressing bandage produce considerable comfort.†

SPECIES IV.
ARTHROSIA HYDARTHRUS.
WHITE SWELLING.

COLOURLESS SWELLING, CHIEFLY OF THE LARGER JOINTS: INFLAMMATION SLOW, AND DEEP-SEATED: PAIN FIXED AND SEVERE: IMPERFECTLY SUPPURATIVE: FEVER A HECTIC.

This inflammation, like that of rheumatism, attacks the larger, rather than the smaller articulations. Yet, as the joints are uniformly the seat of its assault, and it frequently runs through its course without the production of genuine pus, however severe its symptoms and fatal its termination, it has a manifest relation to the two preceding species, and ought to be arranged under the same genus.

The ordinary occasional cause is a strain, or some other injury to the joint affected; but this cause does not equally operate in all persons to the production of such a result; and it is hence obvious, that there is, as in the case of gout and rheumatism, a predisposition or peculiar diathesis favouring the origin of hydarthrus, existing in some individuals, to which others are strangers. And we find this predisposition showing itself also, as we have already seen, in the podagric diathesis, both in persons of a strong, robust, and entonic state of health, and in persons of relaxed and inelastic fibres, particularly in those who inherit a scrofulous taint. And hence the disease exhibits itself under distinct forms, seats itself in different parts of the joint, and demands different modes of treatment.

[In the foregoing editions of this work the author took his description of white swellings chiefly from the writings of Mr. B. Bell, and adopted the very hypothetical division of the disease into *entonic* and *atonic*, meaning by the former case the rheumatic white swelling of several other writers, that most frequently takes place in young plethoric people, "possessing that firm elasticity of health and fibre, which, upon the application of accidental causes, gives rise to rheumatism, as well as this variety of hydarthrus." The *atonic* white swelling was, in our author's opinion, a name suited for that

* Colchicum rarely proves beneficial, unless it produce either nausea, copious perspiration, or purging, or all these effects together. Hence, the common practice is to give the vinum colchici in half-drachm doses, every four or six hours, joined either with magnesia or the sulphate of magnesia, so as to determine its action to the bowels. Modern practitioners seem to be acquiring every day greater and greater partiality to colchicum as a means of relieving gout; and, while the apprehension of various evils from its free employment is not universally allowed to be well founded, its action in shortening the paroxysm of the disease, as soon as nausea or purging is brought on by it, is very generally acknowledged. In cases of active gout, occurring in a full habit, it is best always to let bleeding and a purgative of calomel and antimony precede the exhibition of colchicum. Dr. Spillan, of Dublin, prefers a tincture of the seeds, of which ʒi., ʒiss., or ʒij., may be given at night, and repeated, if necessary, the next morning. This quantity, he says, will generally purge briskly; but if it fail, a third dose the following night will be sure to succeed.—(See his Supplement to Pharmacopœia.) The editor, instead of encountering this risk of losing so much time, prefers giving the wine of colchicum in a mixture, containing magnesia, or the sulphate of it. Colchicum purges, allays pain, and lowers the pulse, and, when we know these facts, we need not trouble ourselves with an inquiry, whether it has a specific power over gout or not.—Ed.

† The American profession is much indebted to Dr. Rush for his enlightened views on the cause and treatment of gout, published many years ago, which induced practitioners to adopt a depletory plan of treatment, by bloodletting, purgatives, blisters, &c., even long before the nature of gout was as well understood as it is now. The practice of applying cold air or cold affusions to the gouty surface or extremities, has fewer advocates in this country than abroad; and too many instances might be cited, where their employment has not only aggravated pain, but induced a fatal metastasis. American physicians sometimes give the colchicum in combination with a solution of tartarized antimony. In this way a more advantageous action of the medicine on the skin is often secured. Opium must be administered with caution, particularly if plethora or local determination to important organs exists; in such cases, it were better to repeat venesection; after which, the well-known Dover's powder is to be preferred. The Eau médicinale has sometimes partially mitigated an attack of gout with us as elsewhere; but it has also been detrimental. Carded cotton to the part affected is much more grateful and soothing than flannel, and the cajeput-oil, blended with some stimulating liniment, is among the best embrocations.—D.

variety which commences in the cancelli of the bones. It is rather extraordinary that Dr. Good should have preferred this principle of division, and selected the epithets *entonic* and *atonic*, which involve us at once in conjecture and hypothesis, instead of a division of the subject founded upon facts demonstrated by dissection, and a choice of names, calculated to express, as correctly as possible, the particular texture chiefly and primarily concerned in each variety of white swelling, and the nature of the morbid changes. When it is considered that our author was not unacquainted with the valuable researches of Mr. Brodie, the course adopted seems the more singular. The editor, not feeling that it would be right, in the present state of surgical knowledge, to repeat the author's description of white swelling, has been obliged to introduce a short sketch of the subject arranged on other principles.

Hydarthrus is divisible into the following varieties :—

α Membranæ synovialis.	White swelling commencing in the synovial membrane.
β Cartilaginum.	——— commencing in the cartilages.
γ Ossium.	——— commencing in the bones.

The term *white swelling* has been commonly applied to enlargements of the joints, in consequence of the colour of the skin being often not at all changed, even in very advanced periods of the disease. As it expresses what is generally true, the name can hardly be found fault with on the ground of its conveying any erroneous notion; yet, it is objectionable on another principle, which is, that it is applied to several diseases of the joints, which are of very different characters in every other respect, thus tending to keep up a want of scientific discrimination, which conduces to a great deal of confusion and obscurity in practice. The texture of the joint, principally and primarily concerned in the disease, and the nature of such disease, form, as we have already remarked, a better and more useful basis of nomenclature.

The synovial membranes of the joints constitute bags, without any external opening; in this respect resembling the peritoneum, the pleura, and the pericardium, to which Mr. Brodie conceives it also bears some analogy, both in its functions and diseases. At all events, experience proves, that it is frequently the seat of inflammation; it is in fact one of the fibrous textures, particularly pointed out by Bichat and other writers, as a common situation of rheumatic inflammation. The consequences of its inflammation, as enumerated by Mr. Brodie, are, first, a preternatural secretion of synovia; 2dly, effusion of coagulable lymph into the joint; 3dly, in other cases, a thickening of the membrane; a conversion of it into a gristly substance; and an effusion of coagulable lymph and serum into the cellular texture, by which it is connected to the external parts. In the museum of the London University are several specimens of adhesions of the folds of the membrane to each other, the result of previous inflammation. Unless the disorder arise from mechanical injury, inflammation of the synovial membrane rarely terminates in suppuration. When the disease is unchecked, it may lead to ulceration of the cartilages; but he thinks that where this change is combined with inflammation of the synovial membrane, the affection of the cartilages is mostly the primary one, and that of the membrane the consequence of the formation of an abscess in the joint.*

The symptoms are pain in the joint, frequently very severe at one particular spot, and followed in a day or two by swelling. At first, the swelling arises entirely from fluid in the cavity of the joint; but afterward the synovial membrane becomes thickened, or lymph is effused on its outer or inner surface; the fluid in the joint is, therefore, less easily felt, and the mobility of the joint itself diminished. As the swelling is chiefly produced by the distended state of the synovial membrane, its shape is not that of the heads of the bones, and is modified by the resistance it meets with in certain directions from ligaments and tendons. The disease is less frequent in the hip and shoulder than in the more superficial joints. *After* inflammation of the synovial membrane has subsided, the fluid is absorbed; and in some instances the joint regains its natural figure and mobility; but in other cases swelling and stiffness remain, and the patient is very liable to a recurrence of the disease, whenever he is exposed to cold, or takes much exercise. Sometimes the inflammation not only lingers in the part, but extends to other textures, and at length the cartilages ulcerate, suppuration is established, and the articular surfaces are destroyed.

Inflammation of the synovial membrane seldom attacks young children, but is very frequent in adults: a feature in which it exhibits a resemblance or relationship to the rheumatic inflammation of fibrous textures in general. Indeed, it is this species of white swelling that is particularly implied in the descriptions given by many writers of the form of the disease to which they apply the epithet *rheumatic*. Mr. Brodie further remarks, it may occur as a symptom of gout or rheumatism; or of derangement of the health by syphilis, or the unskilful use of mercury. In other examples the affection of the joint is quite local, being produced by a sprain or contusion, an extraneous cartilaginous body in the joint, or, what is still more usual, by exposure to cold.

When the case has arisen from the ill effects of mercury, Mr. Brodie recommends sarsaparilla; when from rheumatism, opium conjoined with diaphoretics, and the colchicum, which is also particularly useful where the complaint is connected with gout. But when several joints

* See Brodie's Pathological and Surgical Obs. on the Diseases of the Joints, pp. 16 and 19, 2d edit., Lond., 1822. A different view of this point is adopted by Mr. Key.—See Med. Chir. Trans., vol. xix.—Ed.

are simultaneously attacked, he deems the moderate use of mercury the most successful practice.

In all cases, however, Mr. Brodie has found topical treatment the most important. In the acute stage of the inflammation, he has recourse to leeches and even venesection; aperient medicines; saline draughts and diaphoretics; and, when the swelling and tension are very great, he prefers fomentations and poultices, but, under other circumstances, cold lotions. In the chronic stage, perfect quietude of the joint, leeches or cupping, repeated several times, and a cold lotion, are the means advised. When the inflammation has somewhat yielded he applies large blisters, and, if necessary, repeats them from time to time; a plan which he finds more effectual than that of keeping a single blister open with the savin cerate. In a further stage, when the inflammation has yielded still more, he employs strong liniments, containing a proportion either of lin. ammoniæ, tinctura cantharidum, or sulphuric acid. The remaining stiffness will be removed by friction with the hand alone, or camphorated mercurial ointment; free exercise of the limb; or by allowing a column of water to be pumped on the joint from a height, as is practised at the watering-places.

Another form of disease affecting the synovial membrane, and commonly classed as a white swelling, is that in which the membrane is converted into a thick pulpy substance, of a light brown colour, intersected by white membranous lines. As the disease advances, it leads to ulceration of the cartilages, caries of the bones, wasting of the ligaments, and the formation of abscesses. According to Mr. Brodie's investigation, the disease is slow, but, in the end, the joint is invariably destroyed. The case is rarely seen in any other joint than the knee.

The disease commences with a slight stiffness and tumefaction, without pain. At last, the motion of the joint is generally seriously impaired; though, in some cases, a certain degree of it remains. The swelling is less regular than that produced by inflammation of the synovial membrane, and is soft and elastic, as if arising from fluid. The patient suffers no pain until abscesses form, and the cartilages ulcerate, at which period hectic fever usually comes on, and the patient gradually sinks, unless the limb be amputated.

Mr. Brodie deems this form of the disease incurable. All that can be done is to check its progress by rest and cold lotions; and to alleviate the pain attending ulceration of the cartilages by fomentations and poultices. In the end, the limb must be sacrificed for the preservation of life; at least, until some new treatment, capable of restoring the natural texture of the synovial membrane, be discovered. From certain accounts published of the effects of iodine, employed internally and externally, it would seem to deserve a fair trial. Mr. Buchanan, of Hull, applies the tincture to many white swellings, both in the acute and chronic stages, with surprising success, according to the statements contained in his late publication.—(*Essay on Diseased Joints and the Non-union of Fracture*, 8vo., Lond., 1828.)

One species of the disease, vulgarly denominated white swelling, appears, from the researches of Mr. Brodie, to commence in the articular cartilages; and this change is found to be the primary one in a large proportion of the cases in which the hip-joint is concerned.* Ulceration of the cartilages of the knee is attended with one remarkable difference from inflammation of the synovial membrane, viz., in the former, the pain is at first slight, and gradually becomes very intense, which is exactly the reverse of what happens in the latter. Neither is there, for a considerable time after the disease has begun, any evident swelling, and when this does show itself, it arises from a slight degree of inflammation in the cellular membrane on the outside of the joint, and seems greater than it really is, owing to the wasting of the muscles. No fluctuation is perceptible, as where the synovial membrane is inflamed; nor is there the peculiar elasticity which accompanies the conversion of that membrane into a thick pulpy substance. However, in a few cases, the synovial membrane is secondarily affected, and the synovia or pus may collect within the joint. If the disease proceed, abscesses generally form, the ligaments are destroyed, and the joint becomes dislocated. The editor has seen several cases, in which the head of the tibia has been drawn into the ham; and melancholy examples of the luxation of the thigh-bone from the acetabulum, in consequence of this disease in the hip, may be seen daily in the streets of every city and town in Europe.

In the treatment of primary ulceration of the cartilages of the joints, Mr. Brodie attaches considerable importance to keeping the part motionless. It is this disease, for which he finds caustic issues particularly useful. In the early stage, local bleeding, venesection, and the warm bath, are sometimes serviceable; but stimulating plasters are inefficacious, and friction always hurtful.

Another form of white swelling takes place so often in persons with decided marks of scrofula about them, that it is generally regarded as a scrofulous disease. It originates in the cancellous structure of the bones, and ulceration consequently takes place in the cartilages of the joint, and the disease then follows nearly the same course as when it has commenced with ulceration of the cartilages. The heads of the bones of the affected joint at first become unusually vascular, and deprived of their due proportion of lime, while, at first, a transparent fluid, and afterward a yellow cheesy substance, is deposited in their cancelli. As the caries of the bones advances, inflammation takes place in the cellular membrane on the outside of the

* From some researches undertaken by Mr. Aston Key, it would appear that ulceration of cartilages is preceded by the formation of a vascular substance by the synovial membrane, which substance is the organ by which the cartilaginous tissue is removed.—See Med. Chir. Trans., vol. xix. —ED.

joint. Hence, a puffy and elastic swelling in the early, and an œdematous one in the advanced stage of the disease. At length an abscess is formed in the joint, and, making its way by ulceration through the synovial membrane, bursts externally, after causing numerous sinuses in the soft parts. In the last stage of the disease, the bones, instead of being preternaturally vascular, become less so than in the healthy state; a circumstance to which Mr. Lloyd has imputed the exfoliations which sometimes occur.—(*On Scrofula*, p. 123.)

According to Mr. Brodie's observations, the disease is often met with in children; and is rarely seen in individuals past the age of thirty. The hip and shoulder are less liable to it than many other joints. As it is connected with a particular diathesis, it sometimes affects several joints at the same time, or recurs in others after the one originally attacked has been cured or removed. In this form of white swelling, a degree of pain in the joint, generally not a very distressing one, precedes for some time the occurrence of swelling in the soft parts. When the cartilages ulcerate, the pain increases; but it is not severe until an abscess has formed, and the parts over the abscess become distended and inflamed. When the abscess bursts, a thin pus, with portions of substance resembling curd, is discharged. "I conceive all such collections of matter," says Mr. Hunter, "to be of a scrofulous nature: they are most common in the young subject, and seldom found in the full grown, or old. The suppuration is not proper pus, nor the swelling proper inflammation."—(*On the Blood*, &c., p. 391.) Sinuses then generally remain, at the bottom of which diseased bone may be felt with a probe. In the worst cases, the patient either dies hectic, or is obliged to submit to amputation. In others, a curative process ensues; and the disease terminates either with or without anchylosis, according to the extent of the destruction of the articular surfaces. In the complicated joints of the foot and hand, the chances of recovery are found by Mr. Brodie to be even less than in larger joints.

With respect to the treatment, the plain connexion of the disease with scrofula implies that such general remedies as are calculated to improve the state of the constitution, cannot fail to be proper. Loss of blood seems to Mr. Brodie less useful in this form of white swelling than in some others. He has also seldom known any benefit derived from blisters and liniments; issues and setons, though serviceable, he has only found so in an inferior degree. Cold lotions check the extension of the disease to the soft parts, and retard the formation of abscesses. He lays much stress on the advantages of keeping the joint perfectly quiet, or as far as it can be done with due regard to health. Hence, he is an advocate for mechanical contrivances for this purpose; and as far as the editor can judge, this seems to be the principle chiefly aimed at by Mr. Scott in the mass of plasters, bandages, pasteboard, &c. with which he surrounds the diseased joint and limb.* When abscesses are forming, fomentations and poultices are to be employed. When suppuration ceases, and a tendency to anchylosis begins, Mr. Brodie applies round the limb strips of linen, spread with soap cerate.

As for the means of improving the health, the pure air of the seacoast; nourishing plain diet; steel medicines; mineral acids; and, in children, occasional mercurial purgatives; with the benefit arising from being a good deal in the open air in summer, are those principally recommended.—(*Brodie's Pathological and Surgical Obs. on the Joints*, 8vo., Lond., 1822.)

Some practitioners are partial to the counter-irritation arising from the application of tartar-emetic ointment to the integuments of the diseased joint; some prefer setons; some caustic issues; and others the moxa. But, in numerous examples, all plans seem to fail. Whether the high praises now bestowed on the iodine, as a remedy for white swellings, will be justified by general and impartial experience, time will soon determine. As our author remarked in his last edition] no medicine acts so directly on the absorbent system as iodine; and we are informed by Dr. Gairdner, that M. Maunoir, of Geneva, has in one case of a very decided character, and in which even amputation had been advised, after a failure of every other means, found the use of the ointment of iodine, together with the tincture, completely succeed; so as not only to remove the tumour, but to restore as free a motion to the affected joint as was possessed by the sound knee. The dose of the tincture contained one twelfth of a grain of iodine at its utmost. The patient was eight years of age.—(*Essay on the Effects of Iodine*, &c., pp. 49, 64, 8vo., 1821.) [The most encouraging accounts of the effects of iodine in the cure of white swellings hitherto published, are those of Mr. Buchanan of Hull, who applies the tincture† with a camel-hair brush to the integuments, by which it appears to be rapidly absorbed.‡]

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* See Surgical Obs. on the Treatment of Chronic Inflammation, 8vo., Lond., 1828. The merit of first suggesting this principle of treatment the editor believes due to the late Mr. Cruttwell, of Bath.

† ℞ Iodinæ ʒj., Spir. Vinos. Rect. ʒiij fl. Tinctura.

‡ See an Essay on a New Mode of Treatment for Diseased Joints; and the Non-union of Fracture, 8vo., Lond., 1828. Although iodine applications are frequently useful in the treatment of chronic diseases of joints, the editor does not find their power so great as some writers represent

ORDER III.

EXANTHEMATICA.

ERUPTIVE FEVERS.

CUTANEOUS ERUPTIONS ESSENTIALLY ACCOMPANIED WITH FEVER.

The term Exanthemata among the Greeks, from ἐξανθέω, "effloresco," "per summa erumpo," "to efflouresce, or break forth on the surface," imported cutaneous efflorescences or eruptions *generally*. It has since been limited to express cutaneous eruptions *accompanied with fever*, a boundary assigned to it by Sauvages, Linnéus, Vogel, Sager, Macbride, Cullen, and various others, and this, in effect, is its general meaning in the present day. Dr. Cullen, however, in his note on Exanthemata, thinks it worth considering whether the word should not be restrained to eruptions (he does not say *febrile* eruptions) produced alone by specific contagion; "eruptiones a contagione specificâ ortæ;" while Dr. Willan has still more lately narrowed it, so as to include those eruptions only which fall within the meaning of the English term RASH, whether febrile or not febrile.

The two last senses of EXANTHEMATA, or EXANTHEMATICA, are new and singular. Dr. Cullen, however, has not followed up his own suggestion into his own classification; while Dr. Willan has not always continued strictly true to his own views and definition, as I have observed in the running comment introductory to the present order in the volume of Nosology, to which the reader may turn, for a fuller examination of this subject, at his leisure.

The term, therefore, in the present work, is employed in its common and current sense, so as to include all cutaneous eruptions in which fever exists as an essential symptom; whether accompanied with or destitute of contagion; which last is a doubtful, and perhaps an inappropriate ordinal character: doubtful, because we cannot very precisely tell where to draw the line; and inappropriate, because it is a character that applies to diseases of very different kinds, and scattered over the entire classification, as dysentery and influenza, in which there is fever without cutaneous eruption; itch, and many varieties of tetter, in which there is cutaneous eruption without fever; and blennorrhœa or clap, in which there is neither fever nor cutaneous eruption. The genera included in the order are distinguished by the nature of the eruption, as consisting of red, level, or nearly level patches or pimples filled with a thin ichorous fluid; of pimples filled with a purulent fluid; and of foul, imperfectly sloughing tumours; and hence consist of the four following:—

I. Enanthésis.	Rash Exanthem.
II. Emphlysis.	Ichorous Exanthem.
III. Empyesis.	Pustulous Exanthem.
IV. Anthracia.	Carbuncular Exanthem.

Each of these, with the exception of the third, comprises several species; and all concur in evincing the existence of morbid and specific poisons in the blood, acting the part of animal ferments,* converting the different fluids into their own nature, exciting the commotion of fever, and being eliminated on the surface, as the best and most salutary outlet to which they can be carried, by the very fever which they thus excite.

The whole is a wonderful circle of morbid and restorative action, evincing the most striking proofs of that instinctive or remedial power of nature, whose presence in every part of every living frame, whether animal or vegetable, is continually discovering itself; and which, under the general control of an infinite and omniscient Providence, is perpetually endeavouring to perfect, preserve, and repair the individual, and to multiply its species.

We have many times had occasion to observe, that wherever any diseased action is taking place internally, there is a constant effort exhibited in the part, or in the system generally, to lead it to the surface, where it can do least mischief, rather than let it spread itself on the deep-seated or vital organs, where its effects might be fatal. Mr. John Hunter was peculiarly fond of dwelling on this admirable economy of nature, and of illustrating it from the course pursued in inflammations of every kind (*On Blood, Inflammation*, &c., pp. 236, 450, 467), which, to obtain this beneficial end, often wind their way outwardly through a multiplicity of superincumbent organization, instead of opening into some momentous cavity in the interior, from which it is perhaps only separated by a thin membrane. But there is no part of pathology in which this display of a final cause, of an operative intention admirably adapted to the end, is more striking, than in the order of eruptive fevers.

It is by means of the fever that the disease works its own cure; for it is hereby that a general determination is made to the surface, and the morbid poison is thrown off from the system.

But the fever may be too violent; and, from accidental circumstances, it may also be of the wrong kind; both which facts occasionally occur in inflammations, and require the art of medicine for their correction.

When a febrile poison, producing a cutaneous eruption, is generated or has been conveyed into the blood, a small degree of fever is sufficient to throw it upon the skin; and if it exceed the proper extent, the specific virus will be multiplied, and the fever itself may become a source of real danger. It was formerly the practice to encourage the fever by cardiacs, a heated atmosphere, and a load of bedclothes, from an idea that we hereby solicit a larger flow of morbific matter from the interior to the surface. The fact is unquestionable; for be the exanthem what it may, the skin will hence, in almost every instance, be covered with eruption. But it did not occur to the pathologists of those times, that the morbid virus was an animal ferment capable of multiplying itself by accessories: and that heat and febrile action, beyond

* This language must be understood only in a figurative sense.—Ed.

a very low medium, are among the most powerful accessories we can communicate. And nence the advantage of the modern practice of applying cold water in scarlet fever, and cold air in smallpox, with a view of mitigating the fever that often accompanies these diseases: for, by diminishing the febrile violence, we do not, as was formerly imagined, lock up the contagion in the interior of the system, but prevent it from forming afresh and augmenting there.

But the fever, though the natural mode of cure, may not only be too violent, but it may be also of the wrong kind. And here, again, the whole scope of professional skill is often demanded.

Some of the morbid poisons we are now adverting to have a natural tendency to excite a fever of one description, and others of another. Thus the fever of smallpox and measles is ordinarily inflammatory; that of scarlet fever may commence with an inflammatory type, but it has a strong tendency to run into a typhous form: while that of pemphigus and plague is typhous from the beginning.

Much also, in this respect, will depend upon accidental circumstances, as the constitution of the year, and the prevailing epidemic; the constitution of the patient, his habit of life, or hereditary predisposition. For under the control of these, we sometimes see an eruptive fever, having naturally a typhous turn, restrained in its tendency; and, on the contrary, a fever with an inflammatory turn, as in smallpox or measles, converted into a malignant or a typhous. Yet the general intention pursued by the instinctive or remedial power of nature, is one and the same: and it is the duty of the medical practitioner to watch over that intention, and co-operate with it; to moderate the natural means when in excess; to quicken them when deficient; and to correct them when deflected by accidental circumstances.*

* In the very beginning of acute exanthemstica, congestions of different mucous membranes exist almost constantly, and, as Andral observes, it is a remarkable fact in the history of these diseases, that in each of them the congestion has a determinate situation; in scarlet fever, the mucous membrane of the pharynx; in measles, that of the air-passages; and in variola, that of the stomach. —(Anat. Pathol., tom. ii., p. 224.) Exanthematica are not to be regarded merely as cutaneous diseases; they are rather affections of the whole system, extending their effects to internal organs as well as the surface. In measles, as Dr. Elliotson remarks (Lancet for 1830–31, p. 393), the mucous membrane of the nostrils, the conjunctiva, the mucous membrane of the air-passages, often down to the very air-cells, nay, occasionally the substance of the lungs and the pleura, and even the intestines, are much affected. In smallpox there is great affection of the larynx, such as frequently destroys life; a great affection also of the epigastrium; the stomach is particularly tender, and is really inflamed from the first. In scarlet fever the eyes and nose are not much affected, but the inside of the mouth, the soft palate, the pharynx, and the tongue, suffer intensely, and sometimes in such a degree, that their condition is mainly concerned in producing death. There is sometimes sickness in this disease; an inflammation of the stomach and intestines; the mucous membrane of the alimentary canal is affected below the pharynx, so that there is tenderness in the epigastrium; and sometimes there is inflammation within the head and within the chest, as well as within the abdomen.—En.

GENUS I.

ENANTHESIS.

RASH EXANTHEM.

ERUPTION OF RED, LEVEL, OR NEARLY LEVEL PATCHES; VARIOUSLY FIGURED; IRREGULARLY DIFFUSED; OFTEN CONFLUENT; TERMINATING IN CUTICULAR EXFOLIATIONS.

The term enanthésis is derived from the Greek ἐν, "in, intra," and ἀνθέω, "floreo,"—"efflorescence from within or from internal affection." Whence the term stands opposed to exanthesis, which, in the present system, constitutes a genus under the sixth class, and comprises such efflorescences as are merely superficial or cutaneous, and not necessarily connected with internal or constitutional affection. Enanthésis is here, therefore, used to express fever accompanied with rash, the latter word being employed in the broader of the two senses assigned it by Dr. Willan, as importing red, irregular, confluent patches; whether simple, as in the case of scarlet fever; compounded of papulæ, small, acuminating elevations of the cuticle, not containing a fluid, as in the case of measles; or existing in the form of wheals, as in that of nettle-rash.

And hence enanthésis, as a genus, furnishes us with three species:—

1.	Enanthésis Rosalia.	Scarlet fever.
2.	——— Rubeola.	Measles.
3.	——— Urticaria.	Nettle-Rash.

SPECIES I.

ENANTHESIS ROSALIA.

SCARLET FEVER.

RASH, A SCARLET FLUSH, APPEARING ABOUT THE SECOND DAY ON THE FACE, NECK, OR FAUCES; SPREADING PROGRESSIVELY OVER THE BODY; AND TERMINATING ABOUT THE SEVENTH DAY: FEVER A TYPHUS.

This is the SCARLATINA of most modern writers, a barbarous and unclassical term that has unaccountably crept into the nomenclature of medicine upon the proscription of the original and more classical name of ROSALIA, which it is the author's endeavour to restore.

Upon this subject I must refer the reader to the running comment in the volume of Nosology, where he will find it explained at full length. At present it is sufficient to observe that although, since the introduction of scarlatina, its use has been generally tolerated, no classical scholar has been satisfied with the term, while several have peremptorily refused to adopt it.

Dr. Morton had so mortal an aversion to the term, that he preferred the error of blending

scarlet fever with measles, and of arranging the varieties of the two diseases under the common generic name of MORBILLI, to employing *scarlatina*. De Haen appears to have had nearly as great a dislike to it.—(*Med. Contin.*, tom. i., cap. vii.) Dr. Huxham for a long time eluded the term by using FEBRIS MILIARIS RUBRA, or MALIGNA, for some of the varieties of scarlatina, and FEBRIS ANGINOSA MILIARIS for others: Dr. Heberden has still more lately exchanged it for FEBRIS RUBRA; and Thiery, in direct allusion to the original name, calls it expressly *mal* de la ROSA (*Recueil Periodique*, vol. ii., p. 337); Ploucquet employs PORPHYRISMA, as Borsiero or Burserius had made use of *purpura* before him; Dr. Willan continues scarlatina, but thinks it necessary to apologize for its continuance. "The denomination scarlatina," says he, "was first applied to this disease by British writers: however offensive the term may be to a classical ear, it cannot well be displaced, having obtained admission into all the systems of nosology. Another age will correct and refine the language now used in subjects untouched by the masters of physic."—(*Cutaneous Diseases*, p. 253.) It is singular that Swediaur, with all his love for Greek terms, and the determination with which he set out to give every genus a Greek name, should, while ranking this disease as a genus, still retain the objectionable term.—(*Nov. Nosol. Meth.*, syst. i., 164.)

It will not be the present author's fault if the correction so generally called for in the case before us should be postponed to another age, or the error complained of be chargeable on future nosologists.

In saying that "the denomination scarlatina was first applied to this disease by British writers," Dr. Willan can only mean that it was by British writers first applied *technically*, and introduced as a professional term into the Medical Vocabulary: for the term itself is Italian, and was long as a vernacular name in use on the shores of the Levant before it was imported into our own country.

Scarlet fever, measles, and smallpox seem, indeed, equally to have reached us from the east, and to be diseases of comparatively modern origin. [It has been suspected that the first of these contagions came originally from Africa. In Europe, it first broke out in a severe form in Spain in 1610, and it raged at Naples in 1618. In 1689 it appeared in London, and in 1735 it spread gradually, but slowly, over the American continent.]* Some writers fancy that they can distinguish a few traces of one or two of the foregoing disorders in the works of Paulus Ægina, and other Greek physicians; but the passages referred to are too general and unprecise to establish any such conclusion. No such diseases are described; and had they existed at the time, a few determinate and scattered hints, which may apply to other diseases as well, could not have been the whole to which they would have given rise. The names, indeed, by which they were at first known, as VARIOLA, RUBEOLA, or rather RUBIOLA, ROSALIA, and even MORBILLI, evidently point to the school of Cordova, and lead us to the Arabian or Saracenic physicians for our first account of them. And it is not to be wondered at that in such accounts we should meet with some degree of confusion and many inaccuracies, and should perceive that as measles were for a long time confounded with smallpox, so scarlet fever was with measles; whence it is difficult in one or two instances to determine what is the precise species of disease referred to by Avicenna, Ali Abbas, and Rhazes; for, while they seem to allude to the scarlet fever, we are not sure that they mean it.

On this account it is that roealia, rossalia, and rubeola, alike derived from the colour of the efflorescence, are, among the earliest writers who used these terms, applied equally to scarlet fever and measles; and when some distinction was at length attempted by the introduction of the word *morbillo*, or morbilli, in like manner a Spanish or Cordovan diminutive, the line of distinction not being accurately drawn or adhered to, this term was also erroneously applied to both; and the confusion became more intricate. So *rougeole*, which among the French writers is the common name for measles, imported also at one time scarlet fever: and this so generally, that when in process of time physicians became sensible of the difference between the two maladies, and it was necessary to establish distinct terms, we learn from Chevenau, that among the Marsellois, *rougeole* was at first appropriated to the scarlet fever, while the measles were denominated *senapion*.* And in this manner both diseases continued in every country, till within the last half century, to be regarded and even treated of with but little discrimination; sometimes as different species, sometimes as a common species, and sometimes as varieties of a common species. And hence, even in our own country, we find them united in several of their varieties, not only in the writings of Dr. Morton, but still more lately in those of Sir William Watson.

Since, however, they have been considered, and most correctly, as different diseases, another extreme has been run into; for rosalia itself has been broken into subdivisions that are in no respect worth contemplating separately; one or two of which, as we shall perceive presently, have themselves been elevated by some pathologists into the rank of distinct maladies. For all the purposes of perspicuity, it will be sufficient to study it under the two following varieties:—

* See Gregory's Elements of Physic, p. 126, edit. 2. Prosper Martianus, an Italian physician, who gave a description of the disease as it prevailed in Rome about the middle of the seventeenth century, is said to be, if not the first, among the earliest writers on scarlatina.—ED.

* Observ. Med., p. 454. In 1778, Dr. Withering published an Essay on Scarlet Fever, a second edition of which appeared in 1793; to this author Dr. Bateman assigns the merit of having first accurately described scarlatina as a distinct disease. But Withering seems to have been anticipated by Plenciz, who published in 1776.—ED.

α Simplex. Simple scarlet fever.	Fever moderate, and terminating with the rash; little prostration of strength; slightly contagious.
β Paristhmitica. Scarlet fever with sore throat.	Fever severe; throat ulcerated; rash later in its appearance, and less extensive; often changing to a livid hue: highly contagious.

Children are by far the most frequent subjects of both these varieties, and communicate the disease readily to each other. They are both occasionally epidemic, and in this form occur most usually at the close of the summer. "The scarlet fever," observes Sir Gilbert Blane, "very rarely affects adults. The great majority are under puberty; some between twenty and thirty; a few between thirty and forty. Only one case above forty has occurred to my own observation."* Public schools may be one cause of the greater frequency of the disease in our own day. The anticipating symptoms are those of fever [restlessness, anxiety, depression of spirits, chilliness, pain in the head, soon followed by heat, thirst, and sickness]. About the second day from the beginning of these complaints in the FIRST VARIETY, numerous specks or minute patches of a vivid red colour appear about the face and neck; and within twenty-four hours, a like efflorescence is diffused over the surface of the body, and occasionally even tinges the inside of the lips, cheeks, palate, and fauces. Sometimes the efflorescence is continuous and universal; but more generally on the trunk of the body there are intervals of a natural hue between the patches, with papulous dots scattered over them.* There is an exacerbation in the evening, at which time the rash is most florid, as it is least so in the morning. In some cases that have occurred to me, it has only shown itself in the daytime in the form of scattered patches, or even specks, though the skin has been very generally roughened and rendered anserine from a more than usual determination of blood to the cutaneous papillæ. Yet even in these cases, the pathognomonic efflorescence has appeared in a later or less degree in the evening. On the fourth day, the disease is at its height. On the fifth the eruption begins to decline; the interstices widen, and the florid hue fades. On the sixth the rash is very indistinct, and is wholly gone on the seventh. On the eighth and ninth the cuticle is seen peeling off.

The pulse during the eruptive stage is usually very quick and feeble; the tongue is covered with a whitish fur in the middle, often interspersed with scarlet points from an elongation of the turgid papillæ; while the sides of the tongue are of a dark red. The face is considerably tumefied; and there is great anxiety and restlessness, with a sense of tingling or itching in the skin, and sometimes at night a slight delirium. Though the fever is in most cases moderate, it sometimes runs high, but in the present variety is rarely alarming. In many cases, indeed, the eruption appears and passes through its course with little inconvenience of any kind from fever, itching, or restlessness.

Sauvages, and Cullen, who has copied Sauvages' definition, represent the efflorescence as not taking place till the fourth day after the attack. Dr. Heberden, on the contrary, fixes it on the first or second day (*Med. Trans.*, vol. iii., p. 397); Dr. Willan "usually on the second day." This last is the ordinary period, and as such I have entered it in the definition. It is obvious, however, that the interval observes some variety; though not a little of the apparent difference may be ascribed to the different

* Select Dissertations, &c., p. 213, 8vo., Lond., 1822. The late Earl of Exmouth died of scarlet fever at the age of forty-nine; and Mr. Squib, the auctioneer, in Saville Row, has also very recently fallen a victim to the same disease at the age of forty-five. Both these cases happened in the autumn of 1833. In order to determine the relative frequency of scarlet fever in the sexes at different ages, Dr. Tweedie selected from the register of patients admitted into the London Fever Hospital 200 cases, in the order of their admission. The following table gives the general results:—

Age.	*Males.*	*Females.*	*Total.*
From 6 to 10	7	8	15
10 to 15	8	15	23
15 to 20	17	40	57
20 to 25	14	39	53
25 to 30	8	21	29
30 to 35	6	10	16
35 to 40	1	2	3
40	1	0	1
42	0	1	1
48	0	1	1
57	0	1	1
	62	138	200

As Dr. Tweedie explains, however, the table is not complete, the number of children under six years of age who take the disease not being ascertained, in consequence of no children under that age being received into the above institution. The list shows, however, the great majority of females at every age, and (putting out of consideration cases in children under six years of age) proves, in opposition to Sir Gilbert Blane's statement, that the majority of those who are seized with scarlatina are not under puberty. For if the young children under six years of age be taken into the calculation, no doubt Sir Gilbert Blane's representation would be found to be correct. Dr. Tweedie's list, however, is exceedingly instructive, and certainly exhibits a much larger proportion of cases in individuals past puberty than would have been expected.—Ed.

* When the eruption has begun a short time, there generally can be no doubt of its true nature. Minute red points appear upon the face and neck; they soon become innumerable, run together, and within twenty-four hours form continuous patches over the trunk and extremities. The colour is a bright scarlet, not seen in measles, nor in any other disease, and most vivid at the flexures of the joints and in the loins. The skin, cursorily examined, seems smooth; but if it be inspected with care, it will be found to present minute asperities like those of the cutis anserina. The small points of the skin become a little inflamed, so that the roughness depending upon them had not the coarseness felt in the measles.—See Elliotson's Clinical Lect. in Lancet for 1830-31, p. 393.—Ed.

stages of the disease in which a physician is first consulted, and his inability of fixing very accurately the commencement of the febrile incursion. Dr. Plenciz, on this account, pursues a middle course, and avails himself of an allowable latitude: "About the second or third day," says he, "and sometimes later, the red, unequal eruption makes its appearance."—(*M. A. Plenciz, Med. Vindom. Tractatus de Scarlatinâ*, 1776.) Generally speaking, the more violent the attack the sooner the efflorescence is thrown forth; and hence, during a severe and extensive range in Newcastle-upon-Tyne in 1778, Dr. Clark tells us that, where it began with great vehemence, the eruption was often observed on the first day; but commonly it did not make its appearance till the second or third, and sometimes not till the fourth.

We have seen that rosalia has been often confounded with measles, to which, indeed, it bears, in many cases, no small degree of resemblance. The following distinctive characters, therefore, may be of use to prevent a mistake.

The efflorescence of the measles does not appear till two days later than that of scarlet fever; and, though it consists at first of broad patches amid the general suffusion of red, stigmatized with interspersed dots, the dots are of a deeper colour, and are never lost in the efflorescence. It commences, moreover, with symptoms of a severe catarrh [the eyes have a watery, tender appearance; and the patient sneezes and coughs; the face is flushed, and the head very heavy Frequently, however, the cough does not come on during the first three or four days]. Such symptoms do not belong to scarlet fever; and the measles are without that restlessness, anxiety, and depression of spirits, by which the latter is peculiarly distinguished.

[In the early period of scarlet fever, there is this difference between it and smallpox: in the last, there is frequently intense pain in the loins, and great tenderness of the epigastrium; symptoms not appertaining to scarlet fever. If a person, therefore, be taken ill suddenly, and an eruptive disease be suspected, and yet there is no violent pain in the loins, and no extreme tenderness of the stomach, there is no reason to apprehend smallpox.—(*Elliotson's Clin. Lect. in Lancet for* 1830–31, p. 392.)]

From the great determination of blood to the cutaneous vessels, an effusion of coagulable lymph sometimes takes place in the papulous elevations, which is not entirely absorbed by the time the efflorescence subsides; and hence there is occasionally, though not often, an appearance of vesicles, sometimes nearly empty, and sometimes nearly filled with a pellucid fluid, according as the effused serum has been more or less carried off. I have seen them exhibit the semblance of minute chickenpox; and they have been thus noticed by many writers, particularly by Dr. Rush (*Medical Inquiries and Observations*, p. 123, Philadelphia), Dr. Withering, and Dr. Plenciz: the last of whom compares them to white miliary spots; and expressly states, that he observed them on the sixth or seventh day from the commencement of the eruption, chiefly in the hands and feet: in other words, at the time when the turgid cuticular vessels had contracted, and the efflorescence was on the decline. On examination, he farther tells us, that they appeared to be nothing more than cuticular elevations filled with minute bubbles of air. More correctly, perhaps, they were quite empty, the effused serum being carried off by absorption. M. de Sauvages has made this form of the disease a distinct species, as scarlet fever with him constitutes a distinct genus (*Tractat. de Scarlatinâ*); and as the effused fluid, when its finer parts are first absorbed, occasionally appears thick and opaque, and has some resemblance to minute pustules of smallpox, he has distinguished it by the name of *scarlatina variolodes*.

There is another peculiarity which the disease sometimes exhibits, and to which the attention of the profession has of late been particularly called by Dr. Maton.—(*Med. Trans.*, vol. v., art. xi.) The disorder, in the case alluded to, showed itself in a large family, and evinced all the common symptoms of a mild rosalia; and, like rosalia, it proved itself contagious, for every member of the family, elder or younger, to the number of eight, received it in succession. But its singularity was the great length of interval between the time of exposure to the attack, in those who sickened nearest to each other in the order of its descent, and any sensible effect on the system; which, instead of being, as in ordinary cases, four, five, or six days, was, upon an average, not less than twenty-one days; varying, in different individuals, from seventeen to twenty-six days. And, on this account, in conjunction with one or two other signs of minor importance, Dr. Maton, though he at first regarded the disease as a modification of rosalia, was afterward inclined to believe it a new complaint, requiring a distinct designation. Yet, if we reflect how often a similar, or nearly similar retardation takes place in particular families after inoculation from either the smallpox or cowpox, in which we have a much more definite period to calculate from, we shall rather, perhaps, be justified in adopting Dr. Maton's first view of the disorder, and contemplating it as a rosalia modified by a peculiar family temperament, or some other accidental control. In the paristhmitic variety, or that accompanied with sore throat, the eruption is always later in its appearance than in the simple form; in a case I shall have to quote from Dr. Perceval, not less than eight days later; though I have never known it protracted to so late a period as in the modification noticed by Dr. Maton, where the febrile symptoms have taken place as early as usual from the time of exposure. The efflorescence in the measles, however, sometimes evinces a like procrastination, and has appeared as late as the twenty-first day.—(*Buchholz Tode Med. Chir. Bibl.*, band i., p. 86.)

In the second or PARISTHMITIC VARIETY, the morbid virus is chiefly directed to the fauces, instead of to the surface of the skin generally

It is the scarlatina *Septorrhepes* of Swediaur. And hence, in some cases, the cutaneous efflorescence is very slight, and consists of a few scattered patches of flush, instead of a diffused sheet. The rash, moreover, appears later by a day or two, sometimes even a week; probably delayed by the same cause that interferes with its general spread over the skin, being the local irritation about the throat. [It comes and goes, and when the disease inclines to terminate, the termination is not complete at once; but the desquamations will sometimes continue for weeks.] If the throat be minutely inspected, this last symptom will be found to commence very early; for though no complaint is usually made of uneasiness in the throat previously to the febrile symptoms, yet, if it be closely examined, the velum pendulum palati will be found redder than natural, and sometimes the uvula will appear to be a little inflamed, the pulse being at this time only slightly disturbed, or flurried rather than feverish.—(*Dr. Sims, Memoirs of the Med. Soc. of Lond.*, vol. i., p. 394.) Dr. Willan asserts, that this takes place as one of the first effects of the contagion, and describes it as "a dark-red line, extending along the velum pendulum palati and the lower part of the uvula."—(*Cutaneous Diseases*, loc. cit., p. 269.) Gradually, however, the tonsils become enlarged, and exhibit a florid redness on their surface which extends over the whole range of the palate, its velum pendulum, the uvula, and the posterior part of the fauces; the tongue assumes a high-red colour,* the papillæ over its entire surface are greatly elongated, and very tender to the touch; there is often a considerable stiffness in the muscles of the neck and lower jaw; the throat is rough and straitened from the second day of the eruption; and deglutition is performed with difficulty.

All the common symptoms are more violent; there is more shivering at first, and afterward more intense heat of the body,† the temperature of which rises to 107°, 108°, or 111°; the fever is severer, accompanied with nausea, vomiting of bile, and languor; considerable inquietude and anxiety, headache and delirium; evidently proving a copious determination to the head, as well as to the fauces. The pulse is feeble, the respiration quick; the throat becomes excoriated, and throws off a large quantity of minute, superficial, whitish sloughs, which intermix with the increased flow of viscid mucus, and augment the difficulty of swallowing. The sloughs generally separate about the fifth or sixth day, or at the decline of the efflorescence; but sometimes they remain a day or two longer.

This is the ordinary course; but, in many cases, the symptoms run still higher; and the disease is alarmingly dangerous from its irruption. The pulse is small, indistinct, and irregular from the first; there is a stupid, heavy coma, or violent delirium, with deafness; the ulcerations in the throat are deeper and broader, and covered with dark instead of with whitish sloughs; the tongue is lined with a black, chappy crust, and is exquisitely tender; the breath is fetid; the rash, extensive from the commencement, assumes a livid hue, with intermixed patches of ghastly paleness; and death ensues shortly after the seventh day, sometimes on the sixth.

The affection of the throat, in this last and most virulent attack, bears so near an approach to the malignant paristhmitis, and its peculiar symptoms commence so early, that some pathologists of great authority, and particularly Dr. Cullen and Dr. Withering, have regarded it rather as a variety of paristhmitis or cynanche than of rosalia, whence, in Dr. Cullen's Synopsis, it occurs under the designation of *cynanche maligna*. But, as the scarlet or crimson eruption must be contemplated as a pathognomonic symptom, this is to give us two distinct diseases, with the same essential signs; and Dr. Cullen has done this; for, while he places this most virulent form of rosalia under his genus cynanche, he continues it, in the less virulent form under which we have just described it, as a subdivision of his genus scarlatina. This distinction, however, is altogether unnecessary, and leads to no advantage, either pathological or practical. With the exception of a higher degree of danger in the one than the other, from the fever assuming the character of a more malignant typhus, both forms of the disease are the same; they are equally produced by a specific virus; equally contagious, and at times epidemic; accompanied with a similar rash; demand a like mode of treatment; and even, according to Dr. Cullen's own admission, so frequently run into each other as to be extremely difficult of discrimination. In consequence of which, few later writers have allowed any such distinction whatever. De Haen, therefore, had reason to say, as he does, apparently in reference to Dr. Cullen's arrangement, that different and improper names have been affixed to scarlet fever by different writers; but that varieties in climate or constitution produce the distinctions under which it has been described.

Dr. Withering, however, who was contemporary with Dr. Cullen, embraced and strenuously supported his view; contending that, in scarlet fever with sore throat, the fever is inflammatory, and, in sore throat with scarlet fever, it is putrid. Yet, in describing the treatment of this inflammatory fever, he seems to have lost sight of his critical characteristic; for he tells us that its nature is debilitating or sedative rather than entonic; and condemns both purging and bleeding, as the pulse will not allow of these evacuations.

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* In the mildest form of the disease the tongue is red; but if there be much inflammation of the mouth, the tongue is not only red, as if the mucus upon it were sprinkled with grains of Cayenne pepper, but the papillæ are so elongated as well as red, that they project considerably through the mucus.—(See Elliotson's Clinical Lectures, op. cit.) "The disease attacks the interior of the mouth and fauces, and it even affects the conjunctiva."—Id. in Med. Gaz. for 1833, p. 101.—Ed.

† Even in the mild form of the disease, where the throat is scarcely affected, the heat is very intense.—Elliotson, op. cit.—Ed.

In endeavouring still further to lay down the distinctive characters of the two, he observes, after Dr. Fothergill, that the *angina gangrænosa* (sore throat with scarlet rash) usually commences in the winter or the spring, and chiefly attacks persons of delicate habits, as women and children; while the *scarlatina anginosa* (scarlet rash with sore throat), on the contrary, usually commences in the summer or autumn, and commonly fastens upon the vigorous and robust. The scarlet rash, however, of Newcastle-upon-Tyne in 1778, seems to have reversed this rule in its most essential point; for Dr. Clarke, to whom I have just referred, and who has given a very minute and interesting history of this epidemy, tells us, that it made its first appearance in June, extending from Newcastle over many towns and villages in the neighbourhood; that it was most frequent in August, September, and October, declining about December; and that it raged chiefly among children and young persons, although a few adults exposed to the contagion did not escape.* Dr. Clarke therefore concludes, that both these diseases proceed from the same specific contagion, and ought rather to be considered as distinct forms of the same exanthem, than as distinct affections. It is accurately, also, observed by the same writer, that the epidemy of 1748, which Dr Fothergill has so ably described under the name of putrid sore throat, is essentially the same as that noticed by Dr. Cotton in his letter to Dr. Mead, and which he then denominated scarlet fever, from an objection to any alteration of the name in common use.

The subject ought not to be closed without adding the following note from Dr. Perceval's manuscript comment on the author's volume of Nosology, already noticed on many occasions. It adds a high authority to the present arrangement of this form of the disease; and contains one or two remarks, which very agreeably display the observant tenour of the writer's mind.

"*Cynanche tonsillaris* and *maligna* I consider with you as a species of rosalia. All have been produced by the same specific contagion, which in one instance was imported here (Dublin) from England in a Pandora's box, containing plumed soldiers which had served to beguile the convalescent hours of a young family, and were sent by them as a present to their quondam playmates in this capital. We have had no severe visitation of rosalia in this place for upwards of ten years. In some instances, besides, I have traced the progress of contagion from England, and believe it loses something of its ferocity by the way. Do you think it comes from the continent? A remarkable case occurred to me of *rosalia paristhmitica*, characterized most distinctly with symptoms of what is called *cynanche maligna*. This, with sunk pulse, great prostration of strength, and haggard countenance, ran a course of *seven* days without eruption; during which time it was treated with wine and bark, which removed the affection of the throat. On the *eighth* day, after a rigour, a fever supervened of rather an inflammatory type, with a rosalia eruption. After proper evacuations, the patient recovered."

That rosalia, under every form, is contagious, and sometimes epidemic, is now admitted without a question; and for the later appearance of the efflorescence in the paristhmitic than in the simple variety, I have endeavoured to account. But, whether some countries are more disposed to favour its appearance in the form of an epidemy than others, and particularly, whether under this form it be more common to England than to Ireland, as hinted at by Dr. Perceval, I have no data to determine.

There are three modes by which this, or indeed any other disorder, may become epidemic, using the epithet in its general sense, as importing a disease, of whatever sort, that contaminates the atmosphere of a district or neighbourhood. It may proceed from a specific miasm, generated from local or accidental circumstances in the atmosphere itself, as in the miasm of intermittent and often of remittent fevers; from a like miasm generated in the body of a sick individual, and communicated to the atmosphere, as in typhus; or from a peculiar temperament in the atmosphere, predisposing the entire population that inhale it to a common morbid affection. Of any specific miasm originating in the atmosphere, and producing rosalia, we have no proof whatever: but we have abundant proof of its issuing from the bodies of those who are sufferers under it;* and, if I mistake not, of a peculiar temperament or constitution of the atmosphere in a particular district or season, that predisposes to its general production; for it often becomes common to many families so simultaneously, that they have had no power of communicating it directly or indirectly to each other. And hence, however it may be favoured by external concurrent circumstances, we have good reason for believing that the miasm is always ingenerated; and that

* Observations on Fevers, especially those of the continued type, and on the Scarlet Fever attended with ulcerated sore throat, &c., 8vo., 1779.

* It is not exactly known how long a person is capable of communicating the contagion after he has had the disease; perhaps, according to Dr. Elliotson, not longer than two or three weeks, unless desquamation of the cuticle proceed; and then the exfoliations appear to be so impregnated with the poisonous secretion of the skin, that they may give the disease as long as they continue to be formed. How long they may retain the infection, after separation, seems uncertain. The contagion of scarlet fever often continues very long in a house or hospital into which a case has been admitted. Thus, Dr. Elliotson mentions a patient with scarlet fever, who was admitted into a particular ward, and, for nearly two years afterward, all the children and young men placed in the same ward took the fever, though the ward had been thoroughly whitewashed and cleaned.—(See Lancet for 1830–31, pp. 392–394.) The fact communicated to our author by Dr. Perceval, of the transmission of the contagion from England to Ireland in a box of toys, exemplifies its tendency to adhere a good while to articles which have been handled or worn by patients.—ED.

the disease, when communicated, is always by specific contagion.

We may hence account for its being in a pure and healthy, or unpredisposing atmosphere, but slightly infectious: for, in treating of the laws of febrile miasm, which, under different circumstances, originates both within and without the living body, we had occasion to observe, that when generated in the former manner, it appears to be less volatile than when in the latter, and less readily impregnates a periphery of pure air; whence the infection of typhus, which is commonly derived from this source, may be more easily avoided than that of intermittents or even remittents. The miasms of all the exanthems seem subject to the same law, as they also probably issue from a specific affection of the living body; and hence all of them are comparatively confined in the range of their actions, though some radiate their influence to a much greater distance than others, and are not so soon dissolved or decomposed.

We may hence, also, see why the contagion of rosalia is received much more readily at some periods than at others. Nothing is more common than for a sporadic case of rosalia to occur in a family without communicating itself to the surrounding children, although no pains may have been taken to keep them separate; while, a few months afterward, it may possibly be received from a neighbour's house, merely by an accidental visit for a few minutes. In the one case, there was no predisposition in the habit to receive the complaint; in the other, the altered state of the atmosphere has, perhaps, produced such a predisposition in a very high degree, and prepared the way for the disease to become a very general epidemy.*

What this peculiar state of the atmosphere is has not yet been very accurately ascertained. It does not seem to depend altogether upon the season; though, commonly speaking, rosalia is more frequent towards the close of the summer, the common harvest-time of all debilitating diseases; and we also perceive that it is usually checked, at all periods, by a cold, dry, and bracing air, and hence is less frequent in the winter. But, with these exceptions, it has been found to range as an epidemy nearly equally from February to November, and sometimes through the whole of this term without ceasing; or only slackening its career when a keen dry breeze has sprung up from the north or the east.

We see, also, another peculiarity in this disease, and that is in its ordinary limitation to children; and we see this character accompany it equally, whether the disease be sporadic or epidemic. Or, in other words, we behold the predisposing state of the atmosphere observing the same restriction as the disease itself when it operates independently of any such predisposition. Adults, indeed, do not entirely escape, but their attacks are rare, and, for the most part, less violent.*

The remote cause of rosalia, then, is a specific virus, or a specific miasm generated in the living body. Of its occasional or exciting causes, separate from the predisponents just adverted to, we know nothing. It has sometimes seemed to follow a cold, and, at others, a surfeit of the stomach; but, as these are perpetually taking place without producing such effect, and as rosalia has often occurred where nothing of the kind could be traced, we can lay very little stress upon such casualties.

All exanthems and nearly all fevers produce an influence on the system that renders it less susceptive of the same complaint for a certain period of time afterward; yet the period varies, from the plague, which exempts but for a few weeks, to the smallpox and measles, which usually extend the exemption to a term equal to that of a man's life; in consequence of which these disorders, except in a few anomalous cases, never appear but once in the same individual. Scarlet fever seems to hold a middle range. It renders the system far less susceptible, and, perhaps, for several years; but the influence, in many individuals, wears off by degrees, and does not protect the whole of a man's subsequent life. Yet, as rosalia is a disease of children and young subjects rather than of others, it is not often that persons suffer from it a second time, though examples of such a recurrence are occasionally to be met with.†

[Hahnemann is well known to be an admirer of what is termed *homœopathia*, according to which doctrine diseases should be opposed by remedies, the effects of which are similar to the diseases for which they are given. Having observed that small doses of belladonna produced heat and dryness in the throat, and cutaneous affections, he conceived that belladonna might prove a preservative against scarlatina. About ten years after this suggestion had been made, Berndt put it to the test of experience in an epidemic scarlatina that prevailed in Custrin in 1818 and 1819, and, out of 195 children who were freely exposed to the infection after being put under the influence of belladonna, only 14 took the disease. It would appear likewise, from the statements of Dr. Dusterberg, that belladonna has the power of rendering the consti-

* Independently of atmospheric influence, there are constitutional peculiarities which render some individuals insusceptible of the contagion of scarlet fever. Many persons are in this state, not merely adults, but children; and, though much exposed to the disease, never catch it. Scarlet fever is not by any means so unfailing a visiter, either of children or adults, once in their lives, as the measles and smallpox.—Ed.

* This is contrary to the result of the editor's observations, which coincide with the statement made by Dr. Tweedie:—"It has been generally observed," says he, "that scarlatina proves more severe to adults than to children; and that when it attacks pregnant or puerperal women, it is often fatal."—Ed.

† Dr. Elliotson believes, that its recurrence in the same person is more frequent than that of smallpox or measles. In two thousand cases, however, Dr. Willan never knew it to take place in the same individual a second time. The extreme of infancy is least liable to rosalia, as well as measles.—See Lancet for 1830-31, p. 392; and Med. Gaz. for 1833, p. 100.—Ed.

tution, for a time, insusceptible of the contagion of rosalia. During the epidemic prevalence of this disorder at Gütersloh in 1820, he gave daily to such children as had not been attacked from ten to twenty drops of a solution of three grains of extract of belladonna in three drachms of canella-water; and he assures us that none of the children who had continued this medicine a week were attacked with rosalia, though continually exposed to its contagion. It is also stated that every child that did not take belladonna, and was exposed to the contagion, had scarlet fever.—(*Hufeland's Journ. der Practischer Heilkunde*, 1822.) Whitewashing, cleanliness, free ventilation, and the use of the chlorides, should never be omitted in dwellings where scarlet fever has prevailed. The linen of the sick should always be put, as soon as removed, into water containing the chloride of soda or lime.]

Rosalia is at all times a disease of debility; it prostrates both the body and the mind, but it has, in many cases, a peculiar tendency to weaken the absorbent system, and incapacitate it for carrying off the fluids that are exhaled into the internal cavities of the body, and hence to produce dropsy. This calamitous sequel usually creeps on insidiously and without suspicion, and does not distinctly show itself till the twelfth or fourteenth day, and often considerably later, when the patient and his friends are flattering themselves that all danger is over. It commences with a peevishness, and a feeling of drowsiness and increased weakness and languor: the face is found to swell, and the urine to decrease in quantity, and to assume a somewhat bloody appearance, like the washings of flesh. The leuco-phlegmacy of the face extends gradually to the hands, feet, abdomen, and scrotum, till the whole body becomes puffed up. "I have known these swellings," says Dr. Perceval, "to attack all the cavities, the ventricles of the brain not excepted, and in one instance fatally, upon an eruptive affection so slight as hardly to be noticed. The child was not confined, but went out, and was exposed to air.*

This last hint should not be dropped in vain; for the torpitude produced on the mouths of the absorbents by a sudden or injudicious exposure to cold air, on recovering from rosalia, is one of the most common causes of this lamentable result: and hence we see, also, why it should be more common in winter than in summer, and in children than in adults, from the greater delicacy of their age.† Dr. Withering confirms the instance just offered by Dr. Perceval, that it is occasionally to be found after the mildest form of the disease; but adds, that it follows chiefly its malignant or worst species.

The curative treatment need not long detain us. In slight cases of the simple variety, we may say, with Dr. Sydenham, that the disease hardly calls for medical assistance of any kind. When the fever is mild, it forms, as we have already observed in respect to exanthems of all kinds, the natural means of cure, by determining the specific poison to the surface. An emetic may assist this determination, and has hence been almost always found serviceable; and, if the bowels be confined, an aperient may follow; but violent purging will add to the irritation, and distract the remedial course that is taking place.*

In the paristhmitic variety, the determination, instead of being to the skin generally, is powerfully deflected to the throat and head, and the fever is alarming from its violence. The therapeutic intention is here to counteract this determination of the febrile action, always having regard to the nature of the fever, as well as to its severity.

Bleeding is the most direct and obvious means of reduction; but it is open to the same objection as in typhus; with the additional fact that we have here to deal chiefly with children, who have at all times less surplus of strength to spare than adults. Dr. Plenciz is, however, a strenuous advocate for the use of the lancet, and Dr. Armstrong has recommended it still more lately. Where the head is manifestly oppressed from congestion, it may be risked as a mode of local relief, and may be so far of service; but it is a risk at all times, and ought by no means to form a part of the general curative plan. With the exception of typhous miasm, there is nothing that so much exhausts, or rather, perhaps, suppresses the sensorial power, as the miasm of rosalia; nor is there any evacuation that adds so immediately to the direct debility of the system as venesection, and consequently, none that ought to be so studiously

* If rosalia be severe, there may ensue discharges from the meatus auditorius, sore ears, suppurations in the parotids, and absorbent glands of the neck; pulmonary disease, and diarrhœa; or the fever may be followed by chronic pustular diseases of the skin, called rupia and ecthyma, but which, as Dr. Elliotson observes, are much more common after smallpox. After rosalia simplex there is often a tendency to anasarca, which usually shows itself at the end of the second week, after the decline of the rash.—See Professor Elliotson's Lect. at Lond. Univ., as published in Med. Gaz.—Ed.

† Dr. Elliotson does not adopt our author's hypothesis of a torpitude of the absorbents: for, though he admits that the dropsical swellings following rosalia are most frequent in winter and in cold damp weather, he believes that they are almost always of an inflammatory nature. As in other inflammatory dropsies, he says, the face is affected the very first. He believes, that when effusion occurs in the chest, there is inflammation or sub-inflammation of the pleura; and so, with respect to the abdomen, there is peritonitis; and, with respect to the head, arachnitis.—Ed.

* At the present day, emetics are not so generally given in rosalia as they were some years ago. It is now ascertained that, in simple cases, little more is necessary than mild aperients, except keeping the patient cool, and purifying his chamber by the occasional admission of fresh air, and sprinkling it and the bedclothes with a solution of the chloride of lime or soda, which may also be introduced into the vessels used for the purposes of nature. This practice is particularly recommended by Dr. Elliotson (Clinical Lect., op cit., p. 395), with a view of lessening fetor, and preventing the extension of the contagion.—Ed.

avoided as a general rule. And hence, often as the practice has been introduced by different individuals, it has never been common or established. Even Dr. Withering, who denominated the fever inflammatory, rigidly abstained both from bleeding and purgatives, and confined himself, in the onset of the disease, to emetics.*

Vomiting, which has just been recommended in the first species, is still more necessary in the present; for it not only tends to take off the dry burning heat of the skin, by relaxing it, but unloads the fauces of the mucous and serous fluids that gorge and distend them.

Dr. Withering prohibited purgatives as well as bleeding. But, in doing this, he discovered still further the trammels of hypothesis; for while he conceived that emetics tend directly to throw off the matter of contagion from the organ in which he supposed it to be chiefly concentrated, he conceived at the same time that purgatives, on the contrary, only promote its diffusion along the course of the intestinal canal. This reasoning, however, cannot be allowed: the system should not be weakened by their violence, but their use can rarely be dispensed with. Calomel, as operating upon all the excretories, is commonly to be preferred to any other cathartic, or may be conveniently combined with rhubarb.

The great inquietude that characterizes this disease has induced many practitioners to try opium; but it rarely affords relief in any form or combination, and generally renders the head worse. Ammonia is in every respect a far more useful medicine; it takes off the languor, and stimulates the secernents, especially those of the skin, without quickening the pulse. In the form of subcarbonate, it should be given in doses of half a scruple, dissolved in a large spoonful or half an ounce of water, every three or four hours:† and, in this way administered, it has a highly beneficial and powerful effect upon the local inflammation of the throat. Occasionally also, and in the intervals, we should employ some of the acids, whether vegetable or mineral, which are always grateful to the patient, and seem, more than any other internal means, to diminish the burning heat of the skin. But our chief dependance for this purpose must be upon Dr. Currie's bold and happy plan of employing cold water freely. Sponging will rarely be found sufficient, or rather will rarely be found of equal advantage with affusion; the fluid may, indeed, in this case, be dashed against the patient till the heat is subdued, and the process be repeated as fast as it returns. The refreshment is often instantaneous, and operates like a charm; and seems to show, not merely a refrigerant, but an exhilarating power; the skin immediately becoming softer and moister, as well as cooler. [One caution is requisite, however, viz., only to apply the cold water when the patient is not perspiring, and when the skin is parched and hot.]*

The throat must, in the meanwhile, be deterged with antiseptic gargles of oxymel and port wine, port wine negus, of chloruret, or chloride of soda and lime, and tincture of myrrh, or any of those already noticed under malignant paristhmitis; or fumigated with the vapour of mineral acids.† Blisters may also be applied with good effect. Dr. Withering objects to them; but general experience is in their favour

In severe cases, Dr. Plenciz (*Tractat. de Scarlatinâ*) had recourse to the aurum fulminans, as recommended by De Haen (*Rat. Med. Continuata*, tom. i., part 1, 8vo., Vienna), and speaks warmly of its success. Its design was to operate on the bowels and bladder, and it was given in combination with calomel, rhubarb, and squills. I have never tried it, nor can I very clearly trace out the path by which any benefit may be expected from it. Wine and nutritious food may be allowed (chiefly, as the editor conceives, in the advanced, or typhoid stage), but somewhat less freely than in malignant quinsy. The convalescent state requires

* Account of the Scarlet Fever in 1778, 8vo. No one can entertain a doubt that, when the symptoms indicate inflammation in the head, chest, or abdomen, the practitioner should not dispense with bleeding; nor should he be deterred by any unreasonable fear of typhus and debility from employing the lancet, when the symptoms above alluded to are serious and pressing. The internal inflammation is then the principal source of danger, and leaves no alternative. The debility must be combated when it arrives. If the inflammatory symptoms run high, Dr. Elliotson approves of venesection; but, in general, he deems topical bleeding sufficient, and praises the good effects of fresh air, the lowest possible regimen, cleanliness, few clothes, and keeping open the bowels. It is only when inflammation of important organs comes on that he is an advocate for general bleeding, finding that any local inflammation in ordinary parts will only require topical bleeding.—Ed.

† If the disease show a very considerable gangrenous tendency in the throat, if the pulse be very soft and feeble, Dr. Elliotson recommends the same treatment as in typhus fever. "Among the internal stimulating medicines which it is necessary to give at the last," says he, "carbonate of ammonia is one of the best, with the exception, perhaps, of wine." All impartial practitioners must agree with this eminent professor, that ammonia has no peculiar power over the disease.—Ed.

* If the eruption recede prematurely, Dr. Elliotson advises the warm bath, and friction, with stimulating applications, unless the patches be prevented from coming out by inflammation of any internal parts; then stimuli are to be avoided, and leeches employed.—See Elliotson's Lect. delivered at Lond. Univ., as published in Med. Gaz for 1833, p. 131.—Ed.

† Gargles of the chloride of soda or lime are now generally preferred. When there are dark-coloured sloughs on the throat, which cannot be removed as portions of lymph can, the gargle should be made stronger than that for other cases, in which Dr. Elliotson recommends two ounces of the common solution to ℥ss. of water. When the patient is unable to employ them properly himself, as is the case with children, and with other individuals severely ill, they should be thrown over the affected parts of the throat with a syringe. Cold or even iced drinks will be found very grateful, as relieving the excessive heat of the throat and mouth.—Ed.

great care; and, on account of the tendency to dropsical swellings, a damp cold atmosphere should be especially avoided.*

[Dr. Paul has lately detailed an interesting case (*Edin. Med. Surg. Journ.*, No. xc., p. 55), in which the disease, besides being remarkable for its severity, exhibited the peculiarity of petechiæ and profuse hemorrhages coming on in the convalescent stage: under these circumstances, the good effects of the sulphate of quinine were particularly manifest.†]

SPECIES II.
ENANTHESIS RUBEOLA.
MEASLES.

RASH IN CRIMSON, STIGMATIZED DOTS, GROUPED IN IRREGULAR CIRCLES OR CRESCENTS; APPEARING ABOUT THE FOURTH DAY, AND TERMINATING ABOUT THE SEVENTH; PRECEDED BY CATARRH; FEVER A CAUMA.

Of the earliest accounts we possess of measles, by the Arabian writers called AL-HASSET,

* Dr. Ryan was called to a patient who had been convalescent from scarlet fever a month, at the end of which time he went out at two o'clock, on a cold day in the spring, and returned in a short time completely anasarcous, and died at two next morning.—(Manual of Midwifery, p. 685, ed. 2.) The anasarca and dropsies following rosalia seem to Dr. Elliotson to be most advantageously treated with purgatives and leeches. In all cases purgatives are recommended, and topical bleeding also, if there be local dropsy. In intense cases he even sanctions bleeding from the arm.—(Clinical Lectures, op. cit.) While Dr. Good regards the anasarca and dropsical effusions, consequent to rosalia, as depending upon torpitude of the lymphatics, caused by injudicious exposure to cold damp air, Dr. Elliotson refers them to a degree of inflammation in the parts or cavities affected. Andral supposes them to be connected with the interruption of cutaneous perspiration, produced by the extensive efflorescence on the surface of the body; but this doctrine is hardly tenable, when it is recollected that no such consequence usually arises from erysipelas and other affections of the skin, however extensive. With respect to wine, ammonia, and nutritious food, as recommended in the text, they can only be allowable after all tendency to inflammatory action in the system is over, and the patient is in a very low debilitated state.—ED.

† On the subject of Enanthésis Rosalia, we have been favoured by Dr. J. W. Francis, of this city, with the following remarks:—

"However various," says Dr. Francis, "may be the methods of cure in rosalia adopted by different physicians, all admit the serious character of the disease, and its too often fatal termination. In the United States it frequently* appears epidemically, in places of diversified condition, in populous cities, and in scattered villages; in the pure air of the country, and in the vitiated atmosphere of a crowded and heterogeneous population; and it would be difficult to assert in which sort of location it often proves most destructive. Its fatality, as recorded in our annual bills of mortality, is truly alarming, and seems to reflect little credit on the skill of our most competent prescribers; in the city of New-York alone, during the past six years, no less than fifteen hundred have perished by it. Were greater accuracy exercised to ascertain from what particular causes this vast destruction of human lives by this pestilential disease occurred, some adventitious circumstances might doubtless be found, which would plead in extenuation of the inefficient results of the best efforts of medical skill. Indeed, this specific disease may rage in the boudoir of the rich as well as in the hovel of the needy. Nevertheless, the mixed population of New-York, the mass of foreign and indigent poor, who, with their depraved habits and vitiated morals, annually scatter themselves among its better inhabitants, may with great truth be enumerated as of these aggravating causes. The scarlet fever appears sporadically at all times among us; but the seasons of its greater prevalence, those in which it often assumes the type and potency of an epidemic, are the latter part of the autumn and in the winter months. There are exceptions to this rule, however, in the records of its appearance elsewhere. Dr. Callaghan, in his account of the epidemic anginosa which prevailed at Pittsburgh, Penn., in 1830, tells us, that it commenced with the setting in of warm weather, about the middle of May, the thermometer ranging from fifty to seventy-two degrees, with southerly winds and frequent showers.—(Am. Journal of Med. Science, vol. viii.) Professor Williams, in his history of the disease as it occurred in Deerfield, Mass., in the years 1830 and 1831, mentions that it prevailed extensively through New-England, and that in many towns it was very mortal. At intervals, it continued to prevail from June, 1830, to the time of his writing, November, 1831. The month of May, 1830, was cold and uncomfortable.—(Am. Journ., vol. ix.) For the greater part, it occurs most extensively after seasons of extreme moisture and great variations of temperature: early infancy and youth are most liable to it; but examples at times present themselves of the infant of a few weeks of age, as well as the advanced adult, being subjected to its influence; recently, one of our periodicals contains an account of its fatal occurrence in an adult aged eighty. With old subjects it is often severest in its attacks: I have seen it in both classes, and its formidable recurrence in the person of a middle-aged man, after an interval of seven years. The immunity of the constitution from a second attack is probably less than from that of measles. It almost always has proved fatal to the pregnant female.

"That scarlet fever depends upon a specific contagion is admitted by all, I believe, who tolerate a contagious principle in any disease. The distinguished Dr. Dewees is the only American writer of repute who seems to doubt its contagious character: at least he affirms he has never seen any decided proof that it has communicated itself in any one instance. Nevertheless, in actual practice, he says it will be safest to act under such a conviction. For my own part, I think we are brought to the alternative of rejecting *in toto* the doctrine of contagion in every form of febrile disease, if it is not allowed to be a means of diffusing scarlatina. In private families I have known the several members to become affected from an individual case: Dr. McLean tells me he has attended nine members of one family, who were attacked in succession by it: and we need not advert to its sweeping malignity when it has prevailed in hospitals, alms-houses, public schools (as at Ackworth), and other places where many persons are congregated.

"The luminous history of rosalia, and of its distinctive features, given in the text, supersedes all minute detail on that head: and the division of scarlatina into the *simplex*, *anginosa*, and *maligna*, is so universally adopted, that for practical

الحصبة, the origin of the name of rubeola, and the frequency with which it was at first mistaken for rosalia, some notice has been taken under the last species. In its perfect form, it is unquestionably contagious from a specific miasm, though we shall presently have to notice one variety that is inactive in this respect. Like

purposes it may as well be preserved, though somewhat at variance with the disposition of the subject in the detail by Dr. Good. It is usually from the third to the sixth day after exposure to the contagion that the complaint manifests itself. On the second or third day of the disease, the febrile irritation is considerable; but it may be so on the very first; sometimes we encounter no fever whatever throughout the whole course of the complaint; sometimes the efflorescence puts on its peculiar character almost at the invasion of the disease; and at other times we scarcely can perceive any cutaneous discoloration during its entire existence: sometimes we encounter scarlet fever followed by sore throat; at other times sore throat is followed by scarlet fever: the nature of the former type is perhaps more generally inflammatory, that of the latter more of a typhoid character. Accidental causes may however vary this circumstance, and the most malignant type may arise in the course of a case which at first was of an inflammatory form; while occasionally the latter may halt in its career, and lose its most alarming features. Such is the varied aspect of this Protean disease: an acknowledged febrile complaint, at times without symptoms of fever: an eruptive one, with, at times, no development of cutaneous disorganization. The duration, also, of scarlet fever, exhibits an extraordinary difference in different subjects, according to its type, the predominance of certain symptoms, and the accidental occurrence of peculiar circumstances. In its mildest variety it may continue for some six or ten days; in its aggravated form it may as speedily terminate, or last as many weeks: and the sequelæ of the disease, when it has committed its most serious ravages, have occasionally been to destroy the equilibrium between the absorbent and secretory systems, incurable deafness, &c. &c. One of the most lamentable instances of this last sort which I can bring to recollection, was that in the person of the late mathematician and geographer, John Eddy, of this city.

"The treatment of rosalia must therefore be regulated by many concurring circumstances: in its simplest form it is often almost supererogation to interpose art where nature is so judicious in her operations: in other cases, mild aperients, sudorifics, simplicity in diet, and attention to cleanliness, may often suffice. In its complex form with sore throat, our indications are of a more discriminating order, and challenge our severest judgment and most effective capabilities. I think I have already noticed the prominent circumstances which should be kept in mind when called to a case of scarlet fever. A difference in pathological opinions must necessarily lead to a corresponding difference in our curative means; as, for instance, whether we deem the existing state of disordered action to depend mainly upon the asthenic or sthenic diathesis, upon debility or increased energy. Too exclusive an adherence to either belief has been the prolific source of evil: the practice of viewing scarlatina as a disease of debility, has induced many to recommend, early, bark, wine, alcohol, and the diffusible stimuli, with cordial nourishment, after the method of the older alexipharmic prescribers, and to deprecate all antiphlogistic medicines. After this manner, in order to support the strength, have many epidemical or pestilential disorders at various periods been treated; I need not add with what pernicious results. On the other hand, without due consideration of the specific character of scarlet fever, of the laws which regulate febrile infection, and of the uniform influence which diseases of such origin have in their tendency to induce a greater expenditure of the vital powers, other prescribers have urged, even in the advanced state of the complaint, the antiphlogistic method by copious bleedings, emetics, drastics, cold affusion, and other potent agents; on the ground that all the morbid phenomena depended upon an active inflammatory diathesis. Of the consequences of such a pathology we have too many fatal examples.

"In the treatment of scarlet fever, let us ever recollect the specific nature of the cause of the disease; the variable aspect of the complaint while it runs its course; and its uncertainty as to duration; how specious its promises of proving mild or severe, simple or complicated; and be impressed with the facts which pathological investigation has furnished us. Several writers have recorded the diseased appearances which post-mortem examinations present. Beside the various conditions, the results of morbid action, exhibited in the mouth, throat, and contiguous glands, inflammation, or its consequences, in different and distinct parts, the mucous membrane has been found thickened, effusions of tenacious matter obstructing the passages and air-cells of the lungs; an engorged state of those organs, and sometimes of the liver; a surcharged condition of the peritoneal lining; and often, in the brain, a preternatural vascularity, arachnitis or serous effusion between the arachnoid and pia mater, or in the ventricles. The early appearance of a copious efflorescence may be pronounced a favourable harbinger of the character of the disease; its deficiency is often the cause of severer symptoms; when it is suddenly repelled we must prepare to encounter increased evils on the affections of the throat, and more unmanageable local congestions of the brain or viscera.

"Scarlet fever, therefore, is in its nature essentially inflammatory; but we must bear in mind the disposition which it has, even in its milder form, but especially in its more aggravated type, to partake of the typhoid character: its forming or active stage is of brief duration, say some three or four days; while after that period, in common with other disorders of specific febrile contagion, it assumes a tendency towards a typhoid disease. Our active means of relief ought therefore to be regulated by this important circumstance, and be early enforced; and these, I need hardly repeat, are ever to be regulated by the fact, that if we prostrate the energies of the system too much, we run the greater hazard of encountering augmented difficulties, protracted recovery, and an uncertain cure.

"Emetics stand conspicuous among our efficient means of relief; they unload the mucous surfaces of the fauces and neighbouring parts, and by their general relaxing influence, lessen heat, and arrest internal congestion. Cathartics, administered so as to occasion a pervious state of the primæ viæ, diminish in several ways the sources of irritation, and unless given to an immoderate extent, are not to be dreaded either as transferring diseased action, or as causing greater prostration. Laxatives or mild aperients may perhaps suffice; but an occasional dose of calo

rosalia, also, it is at times epidemic, and probably from the same cause,—a general predisposition in the population of the affected district or country to receive its contagion, perhaps to originate it, from some peculiar but unknown temperament or constitution of the atmosphere.

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mel, united with pulvis purgans, some few grains of calomel alone, or with rhubarb, followed by salts or magnesia, or the infusion of senna and manna, will in most instances be all that a just discrimination asks. Long ago Tozzetti (Burserius) was more than once surprised to find that diarrhœa in this disease, both at its outset and during its progress, proved salutary. Bloodletting from the arm, and leeches to the throat, are so often serviceable, that they may be fairly enumerated among our most approved aids; and the apprehensions of evils which some of the best writers on the history of this disease entertained some twenty or thirty years ago, are demonstrated to be untenable by an improved pathology and the results of modern practice. Indeed, nature is not backward in some instances in anticipating the physician by a salutary hemorrhage from the nose. When inflammation of the throat runs high, and a greater disposition to cerebral congestion exists, venesection will be found indispensable. Antimonials, either as James's powder, or in the still more manageable form of the tartar-emetic solution, exercise a salutary power: their agency in diminishing the action of the heart and circulation, in controlling febrile irritation, and equalizing the functions of the economy, is the best recommendation for their use. Blisters have their advocates: but the application of them ought to be early, within the first day or two after the disease manifests itself; and then local determinations would plead hardest for their service. Indeed, the condition of the surface in scarlet fever seems too often obnoxious to the action of cantharides, and even when cerebral pressure occurs, I would have them to act upon the more remote parts. Like remarks apply to sinapisms, stimulating embrocations, &c. A powerful means of arresting the malignant or ulcerous condition of the throat, is the application of the lunar caustic in weak solution, delicately pencilled over the affected surface. This practice has been pursued in numerous instances by Dr. Hugh McLean, of this city, for thirty years past, with gratifying results.

"Soon after the philosophical Currie, of Liverpool, first published his Medical Reports on the use of cold water in fevers, his suggestions were adopted with an ample confidence of their saving efficacy in the management of scarlet fever; the extremely high temperature created in this disease, it was inferred, would be speedily reduced by cold aqueous ablutions, and striking instances of the efficacy of the plan occasionally occurred. But this means of controlling inordinate heat in scarlet fever with safety and promptitude, is not at present looked upon in the same favourable light as formerly: in milder cases of the disorder, cold ablutions are unnecessarily severe; and in aggravated cases, they must be abandoned on the score of inducing more alarming congestions. Many, I believe, have paid the forfeit of existence by the injudicious application of cold water: hence American physicians more generally, at the present day, employ tepid spongings of water, or of vinegar and water. I must advert to another error of practice, which it will be admitted we have detected at no small sacrifice of human life; I allude to the preposterous design of inducing salivation in scarlet fever, in order the better to secure the safety of the sufferer. The use of mercury to its warrantable extent I have endeavoured to specify. As in a majority of febrile diseases where there is local disorganization and general fever, it is extremely hard to create any sensible mercurial influence on the salivary glands ere the disorder has obtained a prominent sway, so in scarlet fever we have, I think, two powerful obstacles to our securing the wonted benefits of mercury: inordinate fever, which is too general yet to allow the stimulating effects of mercurials, and the local mischief of disorganization in some essential part, which equally forbids its employment: in fine, the disease is too rapid in its march to be checked by the slow progress of salivation. The mortality of scarlet fever would be more within our control, and cease to be the topic of such consternation, were this heroic practice less popular. This at least is my opinion, founded upon a tolerably ample survey of the subject.

"I forbear to dwell upon the medicinal and dietetical measures to be adopted for the purpose of renovating the system after the acute and active course of scarlet fever is passed through. It is so analogous to that demanded by typhus as to supersede at this time further minuteness.

"The anasarcous and other dropsical conditions which are not uncommon consequences of scarlatina, challenge an additional observation. This uncertain disease is still further characterized by the uncertainty of its manner of termination. Dropsical effusions occur sometimes when the eruptive appearances have not been fairly developed; and they are liable to ensue when the eruption has been suddenly repelled. They may follow even when the eruption has been ample and preserved its wonted characteristics. I am inclined to infer, that from the inefficient action of mercury, by its adding to the irritability of an already grievously harassed system, it also frequently is the source of these effusions. Be this as it may, we find almost invariably great tenderness over the whole abdomen, the evidence of sub-acute inflammation. We therefore have our indications well pointed out: bloodletting in some instances, in others free leeching over the abdominal region. diuretics, as squills, nitre, cream of tartar, the lytta, &c. I have in this position of affairs given the elaterium in doses of one sixth or one fourth of a grain, blended with the cream of tartar, two or three times a day. This hydragogue cathartic has relieved the oppression by copious alvine discharges; and, this object accomplished, we may proceed as in a passive state of the system.

"I have said nothing of opiates in scarlet fever; the indications for their employment must be like unto those which influence us in the management of general fever. Plethora, general or partial, may render them very doubtful adjuvants to our sources of cure: but this exception applies not with the same force to the compound powder of ipecacuanha.

"The greater prevalence of scarlet fever within late years compared with a prior period, and its extraordinary fatality, have led me to communicate to you these cursory observations. I know of no prophylactic; and we are left to combat it. True indeed, in Germany, the belladonna is asserted to be preventive; and yet in that country, where this discovery is so lauded, scarlet fever is at this day more rife and fatal than ever. In this opinion I am fortified by the learned Dr. Wm. Leo-Wolf.—(See his Abracadabra, &c., New-York, 1835.) I may be excused from noticing the homœopathic treatment—assuredly the advocates of this system among us have no special reasons to boast

[It has generally been supposed that measles are not contagious before the eruption has appeared; but certain facts lately recorded tend to prove that this opinion is not correct.*]

It occurs under the three following varieties:

α Vulgaris. Common Measles.	Rash slightly prominent, extending over the mouth and fauces; harsh, dry cough, inflamed watery eye.
β Incocta. Imperfect Measles.	Rash running its regular course, with little fever or catarrhal affection; affording no certain security against the common or regular disease.
γ Nigra. Black Measles.	Rash about the seventh or eighth day assuming a black or livid hue, interspersed with yellow; prolonged in stay; and accompanied with extreme languor and quickness of pulse.

The only predisposition or exciting cause of rubeola that we are acquainted with, is the peculiar constitution of the atmosphere just referred to. And, under the influence of this cause, the FIRST VARIETY usually shows itself as an epidemic; generally commencing in the month of January, and ceasing soon after the summer solstice. There seem, however, to be some other exciting causes than a peculiar state of the atmosphere or of the season; for we meet with a few scattered cases of it in almost every month of the year, evidently proving an ingenerate origin, and that the atmosphere is not auxiliary to its diffusion, from its continuing to be merely scattered; yet possessing its ordinary principle of contagion, which only appears to be less generally active, because there is a less general predisposition, in those who have never undergone it, to be acted upon.

It occurs most usually in children, though no age is altogether exempt from it [and it is generally more severe in children than adults]. As rosalia is accompanied with a typhoid fever,† rubeola is accompanied with a catarrhal; and hence, the opening symptoms consist of some degree of hoarseness, with a harsh dry cough, and frequently uneasy respiration; the eyelids are tumefied, the vessels of the conjunctiva turgid and inflamed, the cheeks are wet with a flow of acrid tears, and the nostrils loaded with serum, that excites an almost perpetual sneezing; the head aches or is drowsy; and the stomach, from sympathy, rejects its contents. On the fourth day the rash makes its appearance, and assumes the character described in the specific definition. The stigmatized and pathognomonic dots are sometimes at first attended by so general a flush as to be lost in them, and to give the appearance of scarlet fever. I have already noticed several signs by which the two diseases may be distinguished, and the following may be added to the number. In scarlet fever, there is no cough, the eyes do not water, and the eyelids are not red and swelled. In measles, the papulæ are more acuminated, of a crimson instead of a scarlet hue, and do not appear till two days later than those of scarlet fever *

In smallpox the fever abates as soon as the eruption makes its appearance. In scarlet fever this is by no means the case, and as little so in measles; the vomiting, indeed, subsides; but the cough, fever, and headache grow more violent; and the difficulty of breathing, weakness of the eyes, and indeed all the catarrhal symptoms, remain without any abatement till the eruption has completed its course.

In rosalia we have also seen, that the sooner the efflorescence breaks forth after the febrile attack, the slighter and more favourable the disease. The same occurs in rubeola. The ordinary period we have already stated to be the fourth day, but it occasionally appears on the third, when the patient commonly escapes with but little inconvenience.—(*Van der Haar, Waarneemingen.*) A few rare examples may be found of its exceeding, instead of anticipating, its proper term; and this so considerably, that Buchholz gives us an instance of its not appearing till the twenty-first day: thus precisely rivalling the singular anomaly of scarlet fever already quoted from Dr. Maton.—(*Todd Med. Chir. Bibl.*, b. i., p. 86.)

On the third or fourth day after the eruption first appears, the redness diminishes, the spots fall off in branny scales, which sometimes, however, are scarcely perceptible for their minuteness and tenuity; leaving a slight discoloration on the skin, with considerable itching. On the ninth day from the beginning, where the progress has been speedy, and on the eleventh where it has been slow, no trace of measles remains. The eyes, however, in many cases, continue still inflamed, and the cough is followed with severe peripneumonic symptoms, which may terminate in phthisis. Yet these sequelæ rarely occur, except where the treatment has been improper, or there is a predisposition to consumption from a strumous state of the lungs or some other phthisical diathesis.

If, on inoculation for smallpox, rubeolous contagion should have been previously received into the system, the variolous action will generally be, though not always, suspended till the measles have run through their proper course, when the inserted virus will resume its power, and the variolous eruption follow in its due order. This

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of their triumphs. The *infinitesimal* practice offers a problem for mathematical scrutiny, and I leave it with you."—D.

* See Rust's Mag., Feb., 1827. It is both a contagious and an infectious disease.—Ed.

† This statement, as a general one, cannot be received as correct; rosalia may become typhoid; but is not necessarily so in all, or even the majority of cases.—Ed.

* The crescent or semicircular form of the patches in measles, attended with tenderness of the eyes, cough, &c., will generally leave no doubt about the nature of the disease. It is on the face that the characters of the eruption can be most plainly seen.—Ed.

quality of suspension, however, is not peculiar to the measles. "I have known," says Dr. Perceval in his manuscript comment on the present species, "hex *convulsiva* yield the *pas* to variola, and then resume its station." In like manner, consumption is generally suspended during the entire course of pregnancy, and recommences its inroad on childbirth.

Measles in their more perfect form, which is that we are now contemplating, may be said, as a general rule, to occur but once in the course of a man's life;* for though, as Dr. Baillie observes (*Trans. of a Soc. for the Impr. of Med. and Chir. Knowledge*, vol. iii.), a few instances of a second attack are to be found, *exceptio probat regulam*, they are so rare as rather to maintain, than disturb the law.—(*Roberdière, Recherches sur la Rougeole*, Paris, 1776.) The cases described by Dr. Baillie, however, are very striking, and show a family, rather than an individual susceptibility. His first narration is that of five brothers and sisters, who had it in succession a second time, with one exception, after an interval of six months; the excepted case affording an interval of twenty-one years. His next narrative is that of two sisters, who had a repetition of measles after an interval of four months. Dr. Willan asserts that he never met with an instance. The anomaly is unquestionably less frequent than in scarlet fever, and shows that the influence produced by the rubeolous action on the habit is more rooted and effective.

In its ordinary course, measles is a disease unaccompanied with danger. It is in fact a catarrhal fever with a specific eruption. The fever, as we have observed already respecting exanthems in general, is necessary to a certain extent, for the purpose of throwing the virus upon the surface: as inflammation in a certain extent is necessary to produce healthy suppuration. But a small degree of pyrectic action is in both cases sufficient; for if this be exceeded, the natural means of cure itself becomes the disease, rather than the morbid condition it is intended to remove.

In all instances the extent of the eruption will depend upon the fever, whenever the latter is in excess. And hence our attention is to be mainly directed to the fever itself; for, by diminishing the fever, we necessarily diminish the eruption also. In measles, therefore, the remedies we have already enumerated for a catarrh, are those we are to have recourse to. An emetic is always useful on the incursion of the disease; and should be succeeded by cooling aperients and demulcents, the skin being kept moist, and its heat subdued by mild diaphoretics.

Dr. Cullen recommends bloodletting during every period of the disease; and it has often been practised at its commencement.† It is rarely, however, that this can be called for, except in the case of pneumonic inflammation; and as such an affection does not commonly appear till the close of the measles, we should, generally speaking, as recommended by Sydenham, reserve bloodletting till this period, and not exhaust the patient's strength beforehand; and the more so, as even here the fever has sometimes proved a synochus, and terminated in a typhous form, as particularly noticed by Sir William Watson in the children of the Foundling Hospital in 1763 and 1768, who gives to this modification the name of putrid measles (*Medical Observations*, vol. iv.; *Hoffman. Opp.*, tom. ii., p. 67); if, indeed, this were an example of the genuine disease, of which there is some doubt; though there is little doubt, that in a few constitutions the disease has taken this turn. "In a charity-school where measles prevailed," says Dr. Perceval, in commenting on this species as given in the Nosology, "typhous infection was introduced; hence the variety *a* changed to *γ*." It is highly probable that some such accidental cause occurred in producing Sir William Watson's modification.

Exposure to cold, so peculiarly serviceable to smallpox, has, from a supposed analogy, been recommended also in measles by some rash practitioners, and adopted by others. All fair analogy, however, is against the practice: the fever in measles is directly catarrhal, and the analogy should be drawn, not from smallpox, but from catarrh, in which exposure to cold would, in the opinion of every one, be absurd and mischievous; nor can any thing be so likely to produce pneumonic inflammation, which, in truth, is most commonly the result of carelessness upon this very point. The room should be large and airy, free from currents of cold, but not hot; the drink warm, the food light, diluent, and in a liquid form. If the cough be troublesome, it will be useful to breathe the steam of warm water, not through an inhaler, but over a large basin, with the head covered with a flannel large enough to hang over its edges; and by this means, the inflamed eyes will also have the benefit of the relaxing vapour. If the oppression of the chest, pain, and coughing should return, as they are apt to do on the disappearance of the eruption, venesection or cupping must again be had recourse to, however they may have been employed antecedently. Opium does not, in this case, afford the relief we might expect: it increases the heat and restlessness, but rarely conciliates sleep. A supervening diarrhœa proves the most favourable crisis, and should be very cautiously corrected. And where it does not take place naturally, it may be wise to imitate it by gentle laxatives.

From a peculiarity of constitution, or some accidental influence exercised over it at the

* Few individuals escape the measles: the indisposition to it is less frequent than that to smallpox.—ED.

† "It is always necessary to observe carefully whether there is peripneumonia, or bronchitis, or pleuritis, and to treat it just as if no measles were present; to take blood from the arm or jugular vein, or apply leeches, &c. One would not pay great attention to these symptoms before the eruption occurs; but if they be severe, when the eruption comes out, blood should be taken. Moderate purging is proper, and low diet."—Dr. Elliotson's Lect. at Lond. Univ., as published in Med. Gaz. for 1832-33, vol. xi., p. 70.—ED.

time, the rubeolous rash is sometimes found to run through its regular course with little fever or catarrhal affection, as though it were a simple cutaneous eruption, and without appearing to afford an immunity to the individual against a future attack; constituting our SECOND SPECIES. This has usually been called, and especially by the German writers, spurious measles; but as it occurs most frequently when the genuine measles are epidemic, and is doubtless a result of their contagion, it is less properly a spurious than an imperfect or immatured rubeola; and I have hence exchanged the term *spuria* for *incocta*. Dr. Willan denominates it rubeola *sine catarrho*; but, as the genuine measles themselves, capable of affording emancipation, have sometimes appeared with very slight catarrhal symptoms, *incocta* seems preferable. "Some," says Dr. Heberden, "have been so fortunate as to have the measles appear after suffering so very little from fever, or any of the preparatory symptoms, that they could hardly say they had been ill." In this case, the constitution is protected by a natural insusceptibility of the disease; which is the best protection that can be enjoyed. In the case of imperfect measles, it is only operated upon by some temporary influence: and hence, as soon as this influence ceases, the common susceptibility returns.

The THIRD VARIETY, or BLACK MEASLES, seems to consist in an intermixture of dark, discoloured, or petechial spots from effused blood, with the proper rubeolous rash. It is found chiefly in persons of debilitated and relaxed fibres. and the dark patches will sometimes remain for ten or twelve days after the commencement of the eruption, with no other symptoms of fever than a quicker pulse and an increased degree of languor. It is rarely of serious consequence, unless a typhous infection be accidentally communicated, as mentioned by Dr. Perceval, and usually yields with ease to an infusion of bark with sulphuric acid.

Inoculation has been tried for the measles by employing the acrid serum from the eyes, or from minute vesicles that sometimes appear between the patches of the rash. Dr. Home, not being able to obtain a contagious ichor from either of these quarters, drew blood from a turgid cutaneous vein, where the eruption was most confluent, and, impregnating a dossil of cotton with it, he applied the cotton to a wound made in the arm. It has occasionally succeeded, but more frequently failed; nor does it seem to operate with any certainty in producing a mild modification; for many of the cases of inoculated measles have been quite as severe as we might reasonably have expected from a natural attack. It is, in truth, a very unnecessary caution in a disease which, in its ordinary range, excites so little alarm, and never leaves any blemish, like the smallpox, on the skin.

[While the editor coincides with the author on the question of inoculating for the measles, he deems it proper to mention that it is a point on which much difference of opinion has prevailed. This inoculation was performed with seeming advantages by Home and Horst, and it has been recommended by Vogel, Perceval, Brown, Monro, and Tissot. On the other hand, it has been condemned by Cullen, Girtanner, Rosenstein, Vaidy, and Montfalçon. In 1822, it was again tried by Professor Speranza (*Bibliotheca Italiana, Agosto*, 1825; also *Ed. Med. Journ.*, No. xc., p. 218), of Mantua, in many instances, all of which proved mild. A slight cut was made into one of the most vivid of the large spots with a lancet, the point of which was covered with the blood effused. With this, some small punctures were made in the arm, and a bandage applied.]

SPECIES III.

ENANTHESIS URTICARIA

NETTLE-RASH.

RASH IN FLORID, ITCHING, NETTLE-STING WHEALS; APPEARING ABOUT THE SECOND DAY; IRREGULARLY FADING AND REVIVING, OR WANDERING FROM PART TO PART; FEVER A MILD REMITTENT.

THIS, like the last species, is rather a troublesome than a dangerous complaint,* though it is always attended with some slight disorder of the constitution, as headache, drowsiness, coldness, and shivering, succeeded by great heat, and a white fur on the tongue. But the stomach seems chiefly to suffer; and hence there is not unfrequently pain and sickness in this organ, with great languor, faintness, and anxiety. And, as a sympathetic affection, the eruption has often followed any violent disturbance of the stomach alone, as surfeit, cold cucurbitaceous or other indigestible vegetables, mushrooms, crab-fishes, shrimps, herrings, muscles,† cupreous or other mineral poisons, introduced into the stomach by mistake.

The exciting cause, however, of genuine idiopathic nettle-rash, is usually concealed from us; for it often makes its appearance without any of these irritants, or, indeed, any other that we are acquainted with; and hence Dr. Heberden was inclined to believe that the skin itself is often the chief seat of the disorder, and that the stomach and the system only suf-

* Rubeola, on account of its tendency to bring on inflammation of the bronchial membrane, lungs, or pleura, is a more serious disorder than urticaria. The latter rarely proves fatal; but many children die of measles. An examination of the bills of mortality in some months of the year, would afford ample proof of what is here stated.—ED.

† Other articles of food might be mentioned as producing urticaria—for example, strawberries, some kinds of honey, cherries, fresh pork, and goose; also fish, at some particular seasons, especially mackerel, oysters, &c. Alibert (Monogr. des Dermatoses, vol. i., p. 128) mentions its occurrence in a butcher, after skinning the body of an emphysematous cow; the vapour which escaped from the ntestines and cellular tissue suddenly caused all the phenomena of urticaria, which was very stubborn: and Gibert (Manuel des Maladies spéciales de la Peau, p. 19) states instances where it has been caused by affections of the mind.—D

fer secondarily.* He has hence contemplated it as a modification of lichen, closely connected with the prickly heat of the West Indies, the essera, or rather eshera إشرا of the Arabian writers. The resemblance is close; but there are characters by which the two diseases may be distinguished with tolerable ease. In nettle-rash, the efflorescence is in scattered wheals, with few papulæ; in lichen, in scattered papulæ, with few wheals. In the latter, the itching is more mordicant and aculeate; the eruption, instead of terminating in a few days, runs on to an indeterminate period, and, however irritating, produces little or no fever, and but a slight constitutional affection of any kind.

In Sauvages, on the contrary, nettle-rash is treated of as a scarlet fever under the name of *scarlatina urticata*. But its character, as given in the specific definition, is sufficient to distinguish it from any form of rosalia, which has no wheals, or elevated beds with a defined outline, and no sensation of stinging.

The nettle-rash occurs chiefly in summer, and more frequently among persons of the plethoric or sanguine habit, especially those who indulge too freely in eating and drinking. In children it seems sometimes to be connected with teething, or irritation of the bowels. The eruption commonly takes place at night, after the febrile symptoms just noticed have prevailed for about thirty or six-and-thirty hours: and, on this account, the Arabians elegantly and correctly denominated the coloured wheals بنات الليل (benat-allil), "offspring or daughters of the night."

By the length of the precursive symptoms, the idiopathic disease is distinguished from the sympathetic affection, so closely resembling it, which is occasioned, as already observed, by crapulence, or substances introduced into the stomach that disagree with it. In this last case, the general swelling and eruption take place immediately, and subside as soon as the occasional cause is removed. Wheals of a similar appearance are sometimes found, with other peculiarities, as of a whiter hue, or interspersed with small tubercles, or of very small diameter, except when they unite in clusters: some of these sorts trouble the skin permanently; others vanish and reappear several times in the course of the day; others subside for a week or two, and then rally and reoccupy their stations. But all of them are of chronic duration, are little accompanied with fever, and cannot be considered correctly as varieties of the idiopathic disease. They occur, however, as such, in Dr. Willan's treatise.

A cooling regimen, and subacid diluents, with a free exposure to pure air, generally succeed in effecting a cure of nettle-rash, without any other medical treatment. A gentle laxative or two, however, should be added to the domestic means,* and, if the itching be very troublesome, it may be often allayed by the use of camphorated vinegar.†

Dr. Willan describes a single case in which urticaria proved fatal.—(*Cutaneous Diseases*, p. 401.) The patient was a man of about fifty years of age, who had impaired his constitution by hard labour and intemperance. The precursive symptoms were all violent, and the sickness and languor were followed by fainting-fits; and he had great pain in the stomach, which was increased by pressure. The fever was considerable, and soon attended with delirium. While the rash was most vivid, his internal complaints abated; but he gradually got worse, and died on the seventh day. Here, however, the urticaria seems to have been only symptomatic. It afforded him relief, and offered the only chance of a recovery.‡

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* Med. Trans., vol. ii., p. 173. According to Dr. Elliotson's observations, the most frequent cause of urticaria is the application of cold, especially when the body is heated. It is perhaps sometimes induced by sudden heat. It will frequently arise from an emotion of the mind, or from certain ingesta. In some, almonds and the kernels of various fruits will occasion it, or rather the skin of such kernels, in consequence of its containing hydrocyanic acid, which will now and then have the same effect. So intense is the idiosyncrasy of some persons with respect to its excitement by muscles, that Dr. Elliotson heard of a woman in whom urticaria was induced by one teaspoonful of water in which muscles had been boiled. In some people, he says, malt liquor, white wine vinegar, and common spirits will produce it. Many persons on taking copayva become covered with nettle-rash.† He has known it excited by sulphate of quinine, opium, and subcarbonate of iron in treacle.—Ed.

† Dr. Hewson, of Philadelphia (N. A. Med. and Surg. Journal, vol. v.), has mentioned a case of this kind.—D

* About four years ago, a lady in Charlotte-street, Bloomsbury, was attacked with severe pain in the stomach, occasional sickness, and febrile symptoms, followed by an affection of the skin, which her family supposed was erysipelas; but it turned out to be urticaria. In this case emetics and purgatives may be said to have failed; for, though they gave partial relief, it was only temporary, and every night fresh wheals came out, and the febrile symptoms underwent an exacerbation, until bleeding was practised, which at once stopped the disease. The editor particularly noticed, in this instance, how very rapidly changes occurred in the look of the eruption; so that, while he was in the room, the rash in some places would almost fade away, or change its appearance and form, and assume an increased redness. Dr. Elliotson, in his valuable lectures, relates several facts, showing the efficacy of venesection as a means of relieving urticaria. If the cause be in the stomach, he does not object to an emetic.—Ed.

† The local applications preferred by Dr. Elliotson for alleviating the itching, are the chlorides of soda and lime, and lotions containing prussic or nitric acid.—Ed.

‡ This affection may be intermittent, a case of which is mentioned by Cazenave as accompanying a quotidian intermittent fever: it was cured by Fowler's arsenical solution, after other means had failed. Prof. Dewees seems to have been the first who recommended this remedy for this purpose. Quinine, however, is generally preferred.—D.

GENUS II.
EMPHLYSIS.
ICHOROUS EXANTHEM.

ERUPTION OF VESICULAR PIMPLES FILLED PROGRESSIVELY WITH AN ACRID OR COLOURLESS, OR NEARLY COLOURLESS FLUID; TERMINATING IN SCURF, OR LAMINATED SCABS.

THE term emphlysis is derived from the Greek ἐμ or ἐν, "in, intra;" and φλόσις, "a vesicular tumour or eruption." Ἐκφλόω is usually employed among Greek writers nearly in the same sense as φλόω. In the present system it will be found employed more strictly, and in opposition to ἐμφλόω; so that, while emphlysis, from the latter, imports an eruption of vesicles, whether large or small, produced by or accompanied with *internal and febrile affection* essentially connected with it, ecphlysis, from the former, imports an eruption of vesicles simply cutaneous or *superficial*; or if, in a few varieties, combined with internal affection, not necessarily or essentially associated. Of the last, therefore, we shall have to treat in the third order of our sixth class, entitled ECCRITICA.

The genus EMPHLYSIS includes the following species:—

1. Emphlysis	Miliaria.	Miliary Fever
2. ———	Aphtha.	Thrush.
3. ———	Vaccinia.	Cowpox.
4. ———	Varicella.	Waterpox.
5. ———	Pemphigus.	Vesicular or Bladdery Fever.
6 ———	Erysipelas.	St. Anthony's Fire.

SPECIES I.
EMPHLYSIS MILIARIA.
MILIARY FEVER.

VESICLES SCATTERED OVER THE BODY, OF THE SIZE OF MILLET-SEEDS; TRANSPARENT-RED, AFTERWARD MILKY; PRECEDED BY A PRICKING SENSATION; SIGHING, ANXIETY, AND SOUR SWEAT.

THE disease takes its name from MILIA, "millet-grains," in consequence of the resemblance of its vesicles to the seeds of this plant in size, and, when matured, in colour. There is a doubt when it first made its appearance, and another doubt, among some pathologists, whether it be ever any thing more than a symptom of some other complaint.

It has been treated of at least for a century and a half, and that, too, as an idiopathic malady. It is said to have appeared first of all in Saxony: and the oldest writers assign two varieties to this disease, distinguished in Germany by the names of *Rothen Friesel* and *Weisse Friesel*, or red and white miliaria (*Sindner, Betrachtungen des Rothen und Weissen Friesels*, Schweidnitz, 1735), but perhaps unnecessarily, as both varieties seem in most, if not in all instances, to be only different stages of the same affection. The vesicles are at first red, from the colour of their under surface, or inflamed base, being transmitted through the transparent pellicle; they are afterward opaque and milky, from absorption of the more attenuate part of the fluid, or some other change. In a few cases, however, the red hue seems to have continued throughout; and, in others, the white hue to have appeared from the commencement: a variation in the nature of the secretion, and in the mode of its absorption, producing this difference of effect.

From the redness of the vesicles on their first eruption, this disease has also been denominated, by many writers on the continent, PURPURA; and has hence been confounded with the petechial or flea-bite-like spots that appear in scurvy and putrescent fevers; and the rather as miliaria is also a disease of debility. Ploucquet seems to have intermixed all these, as well as pemphigus, and described them under the common name of miliaria.—(*Initia Biblioth.*, v., pp. 564, 565.) In like manner, Gerike's dissertation on this disease is entitled De Morbo Miliari, *alias Purpurâ dicto* (Hal., 1773); and Juck's, De Febre Miliari, vulgò *Purpurâ rubra et alba*, seu chronica.—(Erfort, 1716.)

From the minuteness of its vesicles, whose elevation can often only be ascertained by the finger, this species treads close upon the general complexion of the genus enanthésis, or rash-exanthem, and, during its red appearance, is often called a rash; and hence another cause of confusion and intricacy. By Linnæus and Parr, it is on this account defined nearly in the same terms as rubeola, so far as relates to the eruption; and at Leipsic, in 1650, where it is said to have been contagious or epidemic, was unquestionably mistaken for rosalia or scarlet fever. As a symptom it sometimes accompanies inflammatory fevers, but more generally those of atony. It is certainly at times attended with flea-bite spots, or petechiæ, and Huxham speaks of it as sometimes giving rise to them: an observation confirmed by a like statement of Boncerf (*Hautesierk, Recueil*, ii., p. 217): and hence another reason why it has occasionally been treated of under the term purpura.

The eruption makes its appearance at an uncertain period after the commencement of the introductory fever; usually, however, on the third or fourth day. It seldom shows itself upon the face; but is first visible upon the neck and breast, and thence spreads progressively over the entire body. The febrile attack is usually somewhat severe in all its stages; the pricking sensation occurs during the hot fit, and is like that of pin-points struck into the skin; the sweat is copious, but proves, by its sour and olid smell, that it is a morbid secretion, and hence affords no relief. The disease runs on, with variable remissions or exacerbations, for seven or even fourteen days, and has sometimes extended to twenty-one days, commonly terminating in a critical and natural sweat; the red transparent vesicles, as already observed, gradually assuming a whiter hue, and losing their transparency; and about the fifth day drying in minute crusts or scales; which, in some instances, are succeeded, as in the case of aphthæ, by a new crop of vesicles, that pass through a like course. Notwithstanding the anxiety

and depression of animal spirits which so peculiarly mark this exanthem, it commonly maintains through its entire range a mild character, undisturbed by any alarming symptoms. In some instances, however, either from the constitution or peculiar circumstances of the patient, or the peculiar temperament of the atmosphere, it puts on a malignant character, and proves fatal in a few days.*

Such a character it seems to have exhibited in the departments of the Seine and Oise in France, in the autumn of 1821, where also it committed a very extensive havoc as an epidemic. M. Rayer, who has given a valuable history of its range in this quarter, tells us that it usually commenced with symptoms of general restlessness, which were soon succeeded by a copious perspiration, that continued through its entire progress, whether it terminated in recovery or death. The eruption, which as usual appeared on the third or fourth day, was general or partial, discrete or confluent. And as the transparency of the vesicle was in some instances without a red basis, and continued till desquamation, he adds to the two varieties of red and white miliaria a third, which he distinguishes by the name of phlyctenous. He tells us also that, on dissection, the mucous surface of the stomach and intestines generally showed some proof of inflammation; an appearance which was likewise traced in various instances in the lungs, and even the brain or its membranes. The cause of the epidemy seems obscure; the air, however, was humid, and the face of the country is considerably mapped with marsh-land.

We have no clear proof of its being contagious; and Stoll (*Rat. Med.*, ii., pp. 58, 169), and most pathologists with him, deny that it is so. It is found, indeed, more frequently as a secondary, or symptomatic, than as an original affection of any kind. Cullen denies that it is ever otherwise than symptomatic. But this is to speak, as we have already seen, in too prescriptive a tone. The author himself, indeed, has lately had a clear and well-marked example of its idiopathic appearance in a young gentleman of a bilious habit, thirteen years of age, in which the vesicles were very numerous, but distinct. They passed through the two stages of a red and milky hue, and terminated on the seventh day in branny scales, unconnected with any other ascertainable disease: and M. Planchon has given abundant instances of the same kind.—(*Dissertation sur la Fièvre Miliare*, &c., Tournay, 8vo.) Professor Frank affirms that it is often epidemic, and in some parts endemic (*De Cur. Hom. Morb. Epit.*, tom. iii., sect. 322, p. 131, 8vo., Mannh., 1792); but his description seems to combine the symptoms of other diseases with those of genuine miliaria, so as to make it a mere satellite upon a more imposing potentate.

Dr. Cullen, however, conceives it to be nothing more than an eruption occasioned by a stage of sweating protracted till it has produced debility, in any fever whatever. But, in this case, we should expect it most frequently in the clammy saburral sweats of typhus fevers, in which it is only occasionally to be met with, and certainly less frequently than in other fevers.*

In few words, miliaria, when idiopathic, is an eruption accompanied with a mild typhus for the most part, though not always, and a peculiar irritability of the skin. And where the same eruption appears as a symptom of some other disease, it is probable that a like irritability of the skin prevails.

It is, however, unquestionably a disease of debility, and has sometimes, like rosalia, been followed by cellular or abdominal dropsy. And to this character of weakness our eye should be directed in attending to its cure. Every thing that heats and stimulates should be avoided. The bowels should be cleared of all irritating materials by mild laxatives; and, if offensive breath, or any other symptom, should indicate defedation of the stomach, an emetic should be given at the first. Cooling drinks, light bedclothes, and a cool atmosphere, will in every case be of essential service; and the patient may be allowed to lie with his hands and arms out of bed.

By these means alone, Dr. Cullen thinks he has frequently prevented miliary eruption in lying-in women and others, where it might have been expected as a concomitant. But where it has actually appeared, he adds to this regimen the use of tonic and antiseptic remedies, particularly Peruvian bark, cold drink, and cold air.

Purgatives, however gentle, have been objected to by many pathologists; but, when not carried beyond the strength of the patient, they rarely fail to be of service. "I am convinced by experience," says Sir George Baker, "that the prudent application of this practice to the miliary fever has been of singular advantage: and it is worthy of observation in this place, that the symptoms of the measles are often rendered less formidable, when, during this disease, the patient has every day two or three evacuations by stool."—(*Med. Trans.*, vol. li., art. xix., p. 300.)

In many instances, however, something more specific than this general plan will be found necessary. In his own practice, the author has endeavoured not merely to check but to change

* This disease appeared epidemically at Wirtemberg in 1801, and raged with such malignancy and violence, that it is compared by Kreysig, who described it, to the plague or cholera: it was confined, with but few exceptions, to individuals between the ages of twelve and forty years.—D.

* The editor lately attended, with Dr. Pinckard, a gentleman in Gower-street, who had had a severe inflammation of his lungs, and being very fearful of cold, he kept his room exceedingly warm, so that during his convalescence he was always in a profuse perspiration, which had a remarkably sour smell, and became attended with an extensive miliary eruption over the sides of the neck and shoulders. Dr. Elliotson has frequently seen the same cutaneous affection on the hands in acute rheumatism, and he states that they are common in measles and scarlet fever.—ED.

the perspiration; and hence, while, from an early period of the disease, he has employed tepid ablution or sponging, which is always highly refreshing, he has given small doses of antimonial powder, with infusion of roses containing a surplus of sulphuric acid; and has rarely continued this course for four-and-twenty hours without finding the sweat less copious and of a more natural quality. And where the languor has been distressing, he has added camphire in the form of pills, giving a scruple or half a drachm in the course of the twenty-four hours.

That the skin is in a state of peculiar irritation is highly probable, from our being sometimes able to excite a like eruption by wearing a shirt of coarse flannel or horse-hair. And hence Dr. Darwin gives one example of miliaria, as he calls it, "produced by the warmth, and more particularly by the stimulus of the points of the wool in flannel or blankets applied to the skin, which by cool dress, and bedclothes without flannel, soon ceased." He has distinguished this affection by the name of *miliaria sudatoria*; but it ought rather to be regarded as a variety of intertrigo, or fret.

SPECIES II.
EMPHLYSIS APHTHA.
THRUSH.

VESICLES GRANULAR, ROUNDISH, PEARL-COLOURED; CONFINED TO THE LIPS, MOUTH, AND INTESTINAL CANAL; TERMINATING IN CURD-LIKE SLOUGHS; OCCASIONALLY WITH SUCCESSIVE CROPS.

Aphtha is derived from the Greek ἅπτω, "accendo," "to burn or inflame." Like the preceding species, this eruption, though at one time supposed to be papulous, is now generally admitted to consist of minute vesicles, containing a whitish or milky fluid when matured; and hence in a nosological arrangement it naturally follows miliaria.

This disease is found under three varieties, a white, a black, and a chronic:—

α Infantum. White thrush.	Appearing in infants soon after birth; and often extending from the mouth to the intestinal canal; mostly with slight febrile symptoms, and white sloughs.
β Maligna. Black thrush.	Accompanied with great debility of vascular action; usually ascending from the larynx into the mouth; sloughs black; fever a typhus.
γ Chronica. Chronic thrush.	Protracted and exacerbating; with great emaciation and hectic fever; extending through the whole range of the intestinal canal.

The disease consists in a peculiar irritation of the whole mucous membrane, and particularly the mucous glands of the mouth and fauces, producing minute vesicles and sloughs. [On dissection, irregular patches of inflammation, slightly elevated above the surrounding parts, and often covered with minute vesicles and ulcers, are found on various portions of the mucous membrane of the intestines, especially the ileum.—(*Abercrombie, in Edin. Med. and Surgical Journ.*, July, 1820.)] In the second and third species, some of the smaller bloodvessels are also eroded at the mouth, and hence the sloughs become livid or ulcerated.

All the varieties, therefore, occur only under circumstances of considerable debility; and hence, while the first is usually found in infancy, the two last are mostly an accompaniment of low fevers, old age, or cachexies.

The WHITE THRUSH, or that of infancy, commences in the mouth. The angles of the lips are usually first beset with the eruption, probably from their exertion and fatigue in the act of sucking. From thence it spreads in scattered papulæ over the tongue and cheeks, till at length many of the papulæ coalesce, and the eruption appears in patches, or strata. The fauces become next affected, and it descends thence through the œsophagus into the stomach, and travels in a continuous line through the entire course of the intestines to the rectum, the fæces being often loaded with aphthous sloughs.

In very mild cases the disease restricts itself, or by judicious management is restricted, to the mouth, and terminates in a single separation of the curd-like crusts. But it usually proceeds further; and a second, and even a third crop, takes the place of that which disappears. The general health is, in the meantime, but little disturbed, though the stomach is disordered, the pulse is often a little quickened, and the infant is rendered fractious. But in an unhealthy habit, when the food is innutrient, and the frame weak and atrophous, the under-surface of the vessels ulcerates, the ulceration spreads more widely and deeply, a low fever ensues, and the little patient sinks beneath its malignancy.

In the mildest form, this eruption seems to be highly acrimonious: for the nipple of the nurse is sure to be affected. There is little doubt, moreover, that the acrimony is specific and contagious: though, in order to multiply itself and preserve its peculiar powers, it seems necessary that it should come into close union with the same membrane, or a membrane of the same structure, as that which originates it. Sine proximo contactu, says Professor Frank, communicari hunc morbum, non facilè concedimus.—(*De Cur. Hom. Morb.*, tom. iii., § 367.) Hence the nipple, though corroded by the sharpness of the humour, does not produce aphthæ, nor does the ulceration spread beyond the reach of the acrid ichor: but it has been received by kissing the infected lips of an infant; and has in this manner propagated itself to adults as well as to children.

But, beyond this, we have good authorities for believing it at times to be epidemic. For, not only all the children of the same family, how cautiously soever separated from one another, but many of those of the same neighbourhood,

have been known at times to suffer from it simultaneously. Yet whether in this case the epidemy be the result of the specific matter of the exanthem, floating as an undissolved miasm in the atmosphere, or whether any particular intemperament of the atmosphere itself predispose the body to the generation of aphtha, is unknown.

In the cure of this species, our first object should be to remove all acrimonious materials from the primæ viæ by a laxative or emetic, or both, and thus, as far as we can conjecture concerning it, root out the primary source of disease. We must at the same time carefully examine the health of the nurse of the infant, if the infant be at the breast, and particularly as to the nature of the milk, and the freedom of the nipple itself from all primary disease, so that the child may not have a foundation laid for it in this quarter. If the child be weaned, we must be particularly attentive to the nature of the food, and the mode of its preparation, concerning which nurses, when left to themselves, are often too careless. And we have next to prevent the multiplication of the papulæ by syringing off the acrimonious fluid as well as we are able with diluting or detergent gargles, and expediting the separation of the sloughs by inviscating astringents, as bole armenic, alum, borax, or catechu, intermixed with mucilage or honey. These astringents, however, must not be made very sharp; for in this case we shall hurry off the little sloughy curds too rapidly, irritate the tender surface of the new skin, and produce a new crop of eruption; which is perhaps excited more frequently by our being thus too busy and precipitate, than by any other means whatever. If the disease have descended into the stomach and intestines, a mixture of rhubarb and magnesia, or a little castor-oil, given occasionally, will be the best medicines.

The second variety, or BLACK THRUSH, is sometimes found idiopathically in old age, when all the vital resources are failing, and the constitution is sinking apace; but it is more commonly a concomitant on acute debilitating diseases; as in typhus, or malignant remittents. Stoll affirms, that, in all these cases, the disorder commences not in the mouth, as in infants, but in the stomach, and works its way both upwards and downwards (*Rat. Med.*, 167); and, from the pain and cardialgia that are often complained of antecedently, there seems ground for this opinion. Birnstiel makes the same remark, and compares the feeling to that of a tense cord extending from the cardia to the navel.—(*Sterblichkeit im Krankenhaus zu Bruchsal.*) This variety is also said to be at times epidemic, and, by some, contagious. But it should be observed, that, in most of these cases, aphtha has appeared as a concomitant of other diseases, and probably as the result of them. Thus, when it is affirmed by Muguet to have been decidedly contagious at Paris on a particular occasion (*Raulin, Von Erhaltung der Kinder*), an alarming typhus seems to have been present also. Stoll gives the same account of it, but it was then united with miliary fever: and on another occasion, when it appears to have had pretensions to an epidemic range, it was combined with a prevailing intermittent.—(*Fontanus, Annal.*, p. 59.)

In all these cases the mode of treatment must depend upon the nature of the particular case. In the drooping of old age, we can only palliate; and our best palliatives will be cordials, as port wine negus, or wine itself, and stimulating nutritive food; where the aphtha is dependant upon some other affection, it can only be remedied by remedying the parent disorder.

In very cold northern, and especially in cold marshy climates, aphtha, in one of its varieties, is said to occur frequently in all ages, and often without fever. As we have already seen that it is very generally the result of a reduced state of health and vigour, this is by no means improbable; and the best means of opposing it is warmth, a pure and unstagnant air, exercise, and a generous diet.

The third variety, or CHRONIC THRUSH, seems chiefly also to have its first seat in the stomach, or some adjoining viscus.

It has been described by Hillary under the name of *aphthoides chronica*, and more lately by Dr. Latham under that of *cachexia aphthosa*. It is more frequently found in hot than in temperate climates, from the inroad which is so often made upon the strength of the constitution by the permanent excitement of the climate.

"A slow hectic fever," says Dr. Latham, "with a pulse weak and a little quicker than natural, marks the commencement of this disease. Pimples on the edges of the tongue, with superficial blisters within the mouth and fauces, next succeed; and a corresponding heat and soreness of the stomach more or less accompany this and every stage of the disease."—(*Med. Trans.*, vol. v., art. vi.) The whole intestinal canal soon afterward becomes affected, and diarrhœa, and, not unfrequently, dysentery, are the consequence. The irritation then subsides, as though the disease had worn itself out; but there is not vigour enough in the constitution to heal the ulcerations; and, the original cause continuing, fresh exacerbations take place, and every symptom is more aggravated, usually accompanied, moreover, with a fearful despondency. These repeated recurrences gradually exhaust the system, and the patient at length sinks beneath their persevering assaults.

Dr. Thomas has given a good account of this affection as it has occurred from time to time in the West Indies.—(*Modern Pract. of Physic.*)

During the exacerbations, opium seems to afford the best relief; while, in the intermissions, light bitters and other tonics should be had recourse to. For the distressing irritation that often exists in the throat and rectum, Dr. Latham is bold enough to recommend gargles and injections of diluted litharge-water; the latter in combination with laudanum

SPECIES III.
EMPHLYSIS VACCINIA.
COWPOX.

VESICLES FEW OR A SINGLE ONE; CONFINED TO THE PART AFFECTED; CIRCULAR, SEMI-

TRANSPARENT, PEARL-COLOURED; DEPRESSED IN THE MIDDLE; SURROUNDED WITH A RED AREOLA.

This disease attracted attention in the county of Dorset about forty or fifty years since, as a pustular eruption derived from infection, chiefly showing itself on the hands of milkers who had milked cows similarly disordered. It had been found to secure persons from the smallpox; and, so extensive was the general opinion upon the subject, even at the time before us, that an inoculator who attempted to convey the smallpox to one who had been previously infected with the cowpox, was treated with ridicule. A formal trial was made, however, and it was found that no smallpox ensued. About the same time, a farmer of sagacity of the name of Nash, duly attending to these facts, had the courage to attempt artificial inoculation on himself; and the attempt is said to have succeeded completely. Similar facts and numerous examples of them were accordingly communicated to Sir George Baker, who, having engaged not long before in a most benevolent though highly troublesome controversy respecting the cause of the endemial colic of Devonshire, was unwilling, notwithstanding his triumph, to tread again the thorny paths of provincial etiology. Gloucestershire, however, another dairy county, had witnessed the same disease, with similar consequences; and the same opinion generally prevailing in distant districts of both counties, afforded proof that the power thus ascribed to cowpox was not wholly visionary.—(*Evidence delivered before the Committee of the House of Commons*, 1821.)

Dr. Jenner, then resident at Berkeley in Gloucestershire, pursued this hint with great judgment and unabated ardour. He was at first foiled by not distinguishing between the genuine cowpox and an ineffective modification of it, or a spurious disease of nearly a similar appearance to which the same animal is subject, but which is no preservative against the smallpox; and found another difficulty in determining the period of time within which the vaccine virus maintains its prophylactic power. Having at length, however, made himself master of the distinctive characters of the genuine vesicle, he ventured to publish the discovery in 1798, and to recommend inoculation with the virus of vaccinia as a substitute for variola. The result is known to every one: the discoverer was justly and liberally remunerated by parliament, and vaccine inoculation has passed with rapid progress over every quarter of the world, from the arctic circles to the extremes of Asia and Africa, and been adopted by civilized and uncivilized nations, by blacks as well as by whites, by the Fin, the Hottentot, and the Hindoo.*

[The exemption from smallpox, enjoyed by individuals who contract pustules or sores on their fingers and hands by milking cows which have a certain disease on their udders and teats, is a fact that has been more extensively known from time immemorial, than the foregoing observations would lead us to suppose. Not only has evidence been adduced, satisfactorily proving that such fact was known to farmers and others having the management of cattle in the principal dairy counties of England, but that it had been remarked by the same class of persons in other countries, as the department of the Meurthe in France, various parts of Germany, Norway, and Spain. In Ireland, the disease in the cow is called *shinach*, an expression derived from two Celtic words signifying *udder* and *cow*: and it is hence concluded that a knowledge of the complaint in that animal must have existed there from a period of high antiquity. Some facts, mentioned by Humboldt in his work on New Spain, leave no doubt that the inhabitants of the Andes have long been in possession of the same information as the dairy farmers of England. Another fact, understood by this class of persons, and received by them traditionally, is, that cows which have once had the disease, do not suffer from it a second time. But the most curious circumstance revealed of late years, is the still greater information that was possessed on this subject by the ancient Hindoos; for in the Sanscrit language there is a work, imputed to Hauvantori, from which it appears that the Hindoos, at a very remote period, were not only aware of the preservative power of the vaccine matter against the smallpox, but actually practised vaccination. The passage to which a reference is here made is cited in the article Vaccine, Dict. des Sciences Méd., where is also quoted a document drawn up by Chaptal, the object of which is to prove that vaccination was suggested in France as early as the year 1781, by M. Rabaut, a Protestant clergyman of Montpellier. The scheme, it is even asserted, was made known by this M.

* It deserves to be mentioned as an historical fact, that the blessings of the vaccine disease were promptly realized in North America: soon after the invaluable discovery of vaccination was made abroad, it was adopted by physicians of the United States with the utmost enthusiasm.

In fact, the individual states seemed to vie with each other in their efforts to extend its blessings, and it was promptly communicated by the American government to the Indian tribes. Hence there is little or no ground for the statement of James Moore, in his "History and Practice of Vaccination," that "in the United States the vaccine had to struggle with a long and violent opposition;" an assertion wholly destitute of truth.—*See* "An Appeal from the Judgment of Great Britain, respecting the United States of America," by Robert Walsh, Philadelphia, 1819.

It is due to the reputation of Dr. Benjamin Waterhouse, of Boston, to state, that by his zeal and activity the cowpox was first made known among us. Being at that time Professor at Harvard University, Cambridge, he declared his belief in the statements he had received from England. He procured some vaccine virus, and subjected his own son to the test of experiment. Hence Dr. Waterhouse has been styled the *Jenner of the United States*.—(See Thacher's Practice of Physic, second edition, Boston, 1826.) For minute details of the early progress of vaccination in the United States, see the several contributions of Dr. Waterhouse and others to the American periodical publications.—D.

Rabaut to an English medical gentleman residing in the family of a rich Bristol merchant named Ireland, then at Montpellier, and who promised to communicate the proposal to Dr. Jenner. This seems, however, more like a little national jealousy, than a fair claim to the honour of the discovery; for no evidence is brought forward to prove that the hint was ever really transmitted to Dr. Jenner, and, if it were really thrown out at Montpellier in 1781, it seems to have been thrown away: for, fifteen years afterward, that is to say, in 1796, when Jenner first vaccinated the human subject, it still remained, as far as the French were concerned, in silent oblivion.*]

The disease, in its present state, may be said to embrace the four following varieties:

α	Nativa. Natural cowpox.	Genuine cowpox, as it ordinarily appears on those who accidentally receive it from the affected cow.
β	Spuria. Spurious cowpox.	An ineffective modification of cowpox, or a different but resembling disease, incapable of preserving against smallpox.
γ	Inserta. Inoculated cowpox.	The genuine cowpox, as it appears on inoculation.
δ	Degener. Degenerated cowpox.	Cowpox degenerated in its specific power of preservation from unknown causes.

In the NATURAL FORM OF COWPOX, or as immediately received by milking or otherwise handling a diseased animal, the vesicles are more or less numerous, and appear on the hands or such parts as have been in contact with the affected udder; of a bluish or azure teint, whence Hebenstreit's proposal to call the disease *glaucina*: the fluid at first limpid; afterward opaque and purulent; often with enlargement of the axillary glands, and considerable fever.

Most frequently the vesicles make their appearance about the joints or extremities of the fingers; their figure is circular, and there is a slight dip from the circumference to the centre. The fever opens with its usual symptoms of lassitude, pain in the head, limbs, and loins, rigour, vomiting, and a quickened pulse; the head sometimes continues affected after these preparatory signs have gone off, and is even accompanied with delirium. The inflamed and ichorous tubercles, having suppurated, burst in three or four days from distention, and become troublesome sores, healing slowly, and occasionally assuming a phagedenic appearance. The fever in the meanwhile abates, and ceases altogether about the seventh day. The fluid discharged from the ulcers is highly contagious; and the eyelids, lips, nostrils, or any other part of the body, are sure to become inoculated with it, if scratched or rubbed with the fingers accidentally charged with it.

In the affected cow itself the tubercles are still larger, or rather consist of vesicles, surrounded by a broad and circular erythema: the animal droops considerably and yields but little milk. The ulcers are foul and often obstinate.

In the SPURIOUS COWPOX, or the disease to which cows are subject that bears a near resemblance to the genuine, and is often confounded with it, though destitute of its prophylactic power, the vesicles are less uniformly circular; purulent from the first; without the bluish teint; with little or no central depression. Whether this, in the animal itself, be strictly a variety of a common species, or a distinct species of a common genus, has not been accurately determined. But it is now fully ascertained, that this affection of the cow produces no security by inoculation, and was the cause of much confusion and many failures at first, and possibly may be of some in the present day.

In the INOCULATED COWPOX from genuine virus, the pathognomonic signs are the following:—vesicle single, confined to the puncture; cellulose; bluish-brown in the middle; fluid clear and colourless to the last; concreting into a hard, dark-coloured scab after the twelfth day.

In propagating the disease from the inoculated vesicle, the fluid should be taken before the ninth day, and from as early a period as it can be obtained. After the ninth day it is usually so inactive as not to be depended upon.

If the fluid be not transparent, it forms a decisive proof, either that it is spurious or imperfect. The puncture should be made as superficially as possible; for if much blood be drawn, the fluid may become so diluted as to be rendered ineffective, or may be entirely washed away.

As smallpox by inoculation is uniformly a far milder disease, and accompanied with a smaller crop of pustules, than when received naturally, cowpox by inoculation undergoes a like change. There is sometimes a little increased quickness of pulse and constitutional indisposition; and, in very rare instances, a few pustules have been thrown forth around the areola or even on the limbs; but, with these occasional exceptions, the eruption, as already noticed, is confined to the single vesicle produced by the puncture, and there is scarcely any perceptible fever.

The general progress is as follows. The puncture disappears soon after the insertion of the lancet; but, on the third day, a minute inflamed spot becomes visible. This gradually increases in size, hardens, and produces a small circular tumour, slightly elevated above the level of the skin. About the sixth day, the centre of the tumour shows a discoloured speck formed by the secretion of a minute quantity of fluid; the speck augments in size, and becomes a manifest vesicle, which continues to fill and to be distended till the tenth day: at which time it displays in perfection the peculiar features that distinguish it from the inoculated

* With respect to the Hindoo claim, it should be recollected, that attempts at interpolation and forgery by the Hindoos upon their own authorities and records are not uncommon. Captain Wilford was actually imposed upon by his pundit, respecting a pretended history of Noah and his sons.—See Life of Sir William Jones.—ED.

variolous pustule. Its shape is circular, sometimes a little oval; but the margin is always well defined, and never rough or jagged; the centre dips, instead of being polarized, and is less elevated than the circumference.

About the eighth day, when the vesicle is completely formed, the disease exhibits something of a constitutional influence; the armpit is painful, and there is perhaps a slight headache, shivering, lassitude, loss of appetite, and increase of pulse. These may continue in a greater or less degree for one or two days, but always subside spontaneously, without leaving any unpleasant consequence. During the general indisposition the vesicle in the arm becomes surrounded with a circular inflamed halo or areola, about an inch or an inch and a half in diameter, which is the pathognomonic proof of constitutional affection, how slightly soever the internal symptoms may show themselves. After this period, the fluid in the vesicle gradually dries up; the surrounding blush becomes fainter, and, in a day or two, dies away imperceptibly; so that it is seldom to be distinguished beyond the thirteenth day from inoculation. At this time the vesicle hardens into a thick scab of a brown or mahogany colour; and, if not separated antecedently by violence or accident, falls off spontaneously in about a fortnight, leaving the skin beneath perfectly sound and uninjured. The entire progress of the inoculation scarcely opens a door to any medical treatment whatever. No preparatory steps are called for, as in smallpox; and all that can be necessary is a dose or two of some aperient medicine, if the constitutional indisposition should be severe or troublesome.

[Besides the above described circular inflamed areola, as a test of vaccination having extended its effects to the system, another criterion has been suggested by Mr. Bryce; whose experiments prove, that if, during the regular progress of cowpox, a second inoculation be performed a certain number of days after the first, the affection produced by this second inoculation will be accelerated in its progress, so as to arrive at maturity and again fade at nearly the same time as the affection arising from the first inoculation. About the end of the fifth or beginning of the sixth day from the first vaccination, is the period preferred for the experiment. —(*Bryce's Pract. Obs. on the Inoculation of Cowpox*, 2d edit.)]

There is a variety of vaccinia denominated DEGENERATE COWPOX by Sir Gilbert Blane in his evidence upon this subject before the Committee of the House of Commons, of which the following may be regarded as the character. Produced by inoculation; vesicle amorphous or uncertain; fluid often straw-coloured or purulent; areola absent, indistinct, or confused with the vesicle; scab formed prematurely. The cause of this degeneracy has not yet been sufficiently pointed out; but it is now well ascertained, that inoculation from this species will not prevent the smallpox; and hence a variety of mistakes in the early practice before the fact was discovered.

Vaccine virus seems to undergo a spontaneous alteration in a certain period of time, whatever be the caution with which it is preserved; but there are some circumstances that seem to favour this alteration more than others, although we know but little of the nature of these circumstances. Even in passing through the human subject in the form of inoculation, it appears to be modified, and to be rendered milder; for a person immediately inoculated from the infected cow uniformly suffers more than one person inoculated from another. It has been proved, however, that the fluid loses nothing of its specific power after a certain number, and even a long series of transmissions from individual to individual; for cows have been inoculated with it in this state of repeated descent, and have exhibited the disease in all its natural violence. Yet, if the second variety be a modification of this disease, and not a distinct eruption, it bears witness to a change in the qualities of the virus taking place in the animal itself from some undiscovered cause.

It ought also to be stated, that the genuine cowpox itself has not proved a permanent prophylactic in particular habits or idiosyncrasies, of the nature of which, however, we know nothing. But the cases in which it has failed are very few; and, in almost every instance, the smallpox occurring afterward seems to have been changed from its natural course, and rendered milder and of shorter duration; the pustule rarely exceeding the fifth day before it has begun to turn, and the fluid generally passing at once from an ichorous or limpid into a concrete or indurated state, without the intervention of pus. While, therefore, the absolute infallibility of the prophylactic power of cowpox inoculation is no longer to be maintained, enough still remains in support of its pretensions of being one of the most important discoveries in medicine, and one of the greatest blessings that has ever been conferred on mankind; as has been sufficiently proved in an admirable article published by the French Imperial Institute, and drawn up by three of its brightest ornaments, MM. Berthollet, Percy, and Halle, of the date of August 17, 1812.

For the failure of success in many hundreds of instances that have been triumphantly brought forward by its enemies, there is no difficulty in accounting; but there are others which are not to be disposed of in the same manner, and which irrefragably establish its inefficacy from causes that elude all explanation.* It was at one time conjectured by our own National Vaccine Establishment, that many of these cases of failure were to be ascribed to the use of a

* Among the various hypotheses advanced by writers to account for the failure of the prophylactic power of vaccinia, may be mentioned that of Dr. Leo-Wolf, now of New-York: in his work "Ueber die Gefahren der bisher befolgten Maasregeln zur Verbreitung der Kuhpocken-Empfang, Hamburg, 1822," he advances the opinion that the changes produced in the system by *puberty*, destroy in many cases the protective power of kinepock.—D.

single puncture alone, in consequence of which two or more punctures were recommended on each arm. This hypothesis, however, seems now to be abandoned; and indeed, after the numerous and cautious experiments upon the subject of inoculation for the smallpox by Camper, which have abundantly shown that a single effective puncture proves as secure, and produces as large a crop of pustules, as any number up to seven, which was the highest he thought worth while to try (*Dissertatio de Emolumentis et optimo Methodo Insitionis Variolarum*, Gronin., 1774), it is not a little singular that it should ever have been adopted; and the observation of Professor Thomson is far more worthy of attention. "I have not been able," says he, "to discover, after the most minute attention, that any difference of effect whatever in the modifying power of vaccination has depended upon the skill of the operator, or upon his peculiar mode of performing the operation." —(*Historical Sketch*, &c., p. 398.) The real merits of the case, however, are summed up with great candour and judgment in the following passage of a subsequent report of the public establishment just alluded to. "After every reasonable deduction we are compelled to allow, that too many cases still remain on undeniable proof, to leave any doubt that the pretensions of vaccination to the merit of a perfect and exclusive security in all cases against smallpox were admitted at first rather too unreservedly. Yet the value of this important resource is not disparaged in our judgment; for, after all, these cases bear a very small proportion to the number of those who are effectually protected by it." Eight only are stated by the metropolitan stations, out of nearly 67,000 vaccinated since the establishment of the board; and "we have undoubted proofs, from experience, that, where vaccination has been performed perfectly, smallpox occurring after it is almost universally a safe disease; and, though ushered in by severe symptoms, has hardly ever failed to be cut short, before it had reached that period at which it becomes dangerous to life." —(*Report of April* 12, 1821.)

There was some cause for alarm, however, in the information formerly communicated by Dr. Gregory, physician to the Vaccine Hospital, that the table kept at this establishment manifests that the prevalence of smallpox after vaccination is on the increase. "From this table it appears," says he, "that in the year 1810, the proportion of cases of smallpox succeeding vaccination to the whole number of admissions, was as one in thirty; in 1815 as one in seventeen; in 1819 as one in six; in 1821 as one in four; and during the year 1822, as one in three and a half."—(*Cursory Remarks on Smallpox, as it occurs subsequent to Vaccination*, &c.; *Med.-Chir. Trans.*, vol. xii., part ii.) This is, indeed, a fearful diminution of protective power. But, as I have already noticed the wonderful loss of energy which the genuine virus of the cow undergoes in passing through the human subject in the form of inoculation, even for the first time, it is possible that its increasing inertness may depend upon the innumerable transmigrations from individual to individual that it has now sustained; and that we ought, at given periods, or after a given number of successive inoculations, to return to the primary fountain for a recruit.

[The hypothesis of a diminution in the energy of vaccine lymph, by its being repeatedly transferred from individual to individual, is entirely destitute of proof. As far as the eye can be trusted, vaccine lymph produces the same sensible effects on the skin, and presents in other respects the same properties at the present day, which it did in 1799 and 1800. "I know, in point of fact," says Dr. Thomson, "that the vaccine virus which has been used at the Royal Public Dispensary here and in other parts of Scotland for a series of eighteen years, still continues to produce in those who are inoculated with it the very same appearances which it produced on the first trials that were made with it, and that these appearances agree exactly with those which have been delineated and described by Dr. Jenner as characteristic of cowpock."—(*On Varioloid*, &c., p. 315.) As an anonymous critical writer well remarks, the supposition of a change in the anti-variolous power of cowpock is inconsistent with the historical facts of the case. It is not the fact that vaccination fails to afford the protection against smallpox which it once did. Vaccination never afforded perfect or absolute immunity from smallpox contagion; and it furnishes at the present moment as much security as it ever did. Its influence was indeed exaggerated, and it was supposed to be an absolute preventive of smallpox, because persons who had undergone vaccination were found insusceptible of the inoculated smallpox. At the era of the introduction of vaccination, it so happened, that no great smallpox epidemic existed, and there was consequently little or no atmospheric contagion to communicate the disease in the most effective mode. As soon, however, as the variolous contagion began to prevail epidemically, it was found, not that vaccination had lost its power, but that it never possessed more than a relative influence over smallpox. The correctness of this conclusion, it is argued, appears not only from the results of the experiments performed by Dr. Woodville in the Smallpox Hospital of London in 1799, but from the phenomena of the epidemic of 1816, 1817, and 1818, in various parts of the country, and even in several countries of Europe. It was then observed, that the persons who had undergone vaccination at the time when the practice was first introduced, and who consequently had been vaccinated with lymph which, according to the hypothesis of deterioration, must have been in its original purity and strength, were not less liable to smallpox, and suffered the disease with no less severity, than those who had been vaccinated only a few months before, and at all intermediate periods. Dr. Thomson has seen several instances, and heard of others, in which the varioloid disease, during its prevalence in Scotland, had attacked individuals who had been inoculated at an early period of the practice with vaccine matter ob-

tained from the most authentic sources. On the whole, the conclusion is unavoidable, that unless it could be shown that the occurrence of smallpox in the persons of the vaccinated was confined exclusively to those who had been subjected to this process within the last few years, the hypothesis of deterioration in the lymph, and change in its properties, must be rejected. —(*Edin. Med. and Surg. Journ.*, No. lxxxix., p. 391, et seq.)

With respect to Dr. Gregory's report, it merits particular notice, that it does not pretend to give an account of *the average number of cases of smallpox after vaccination in society at large*, but only the proportion of such cases in the total number of admissions into the Smallpox Hospital. The proportion might, therefore, partly depend upon what cases were fortunate enough to be admitted; and, if all that applied were received, the increasing number of examples of smallpox, after real or *presumed* vaccination, only proves that such cases are becoming more common. As a material deduction also from the alarming tenour of this report, it is to be recollected, that the circumstances taken as a criterion of the parties having undergone vaccination, are not such as a cautious reasoner would consider by any means conclusive. "All cases," says Dr. Gregory, "are here entered as having undergone vaccination, *where the cicatrices were apparent*, or (if that criterion were wanting) *where the patient had a distinct recollection of the arm having risen*, and of the general progress of the disease."—(See *Med. Chir. Trans.*, vol. xiii., p. 325.) Neither the scar, the patient's own recollection and judgment of the progress of the disease, nor even those of his friends, for vaccination is generally done upon infants, can be entitled to absolute confidence. The editor of this work has had occasion to see two *supposed* examples of smallpox after vaccination; but, when the history of the cases was inquired into, the only inference that could be depended upon was, that the parties had been inoculated in their infancy with supposed vaccine lymph; but no particulars of what followed the inoculation could be obtained from the surgeons who performed the operation, and saw the progress of the vesicles. As for the value of unprofessional evidence on such points, and of a conclusion drawn from the look of the cicatrix, which may follow any festering sore or slough consequent on a puncture, it is not what ought to be rated too high. In short, nothing can be implicitly depended upon but the history and all the particulars of the alleged vaccination, delivered by a well-informed medical practitioner.]

The only case that has ever occurred to myself in which vaccination has not seemed to produce any influence whatever upon the character of subsequent smallpox, is one I was attending while writing the first edition of this work. The patient was Mr. Alfred Phillips, of Christ's College, Cambridge, about twenty years of age, who had been vaccinated when an infant by Dr. Jenner. The eruption was of the distinct variety, but, for this variety, as full as possible over the whole of the face, body, and limbs; the fever had been very considerable, and every part was severely hot, sore, and tumefied, so that the eyes were nearly closed, and always opened with difficulty in the morning; and the spaces between the pustules, which, however, were few and small, were of a fiery red. The pimples made their appearance on the third day from the accession of the fever; they ripened regularly, and were, on the eighth day of the eruption, very large, and a few of them just beginning to turn brown on the apex, so that it is not necessary to follow up the description any further. [The editor has seen two cases in which smallpox was exceedingly severe after *presumed* vaccination, and not at all modified by the influence of the effects of the latter disease on the system.]

It is possible that there are other animal poisons which may in like manner act as a prophylactic against smallpox, and destroy the susceptibility to this disease in the human frame; for the same effect seems to have followed from inoculation with the sanious discharge from the heels of horses afflicted with the disease called *grease*. And Dr. Jenner, who, on his first directing his attention to the nature and effects of cowpox, applied himself also to this subject (*Inquiry into the Causes and Effects of the Variolæ Vaccinæ*, pp. 27, 37), felt persuaded, at that period, that the two fluids of cowpox and of grease from the heel of a horse are precisely the same, and capable of affording a like emancipation. He conceived the sanious fluid of the grease to be the original disease, and the cowpox in the cow itself to be nothing more than a casual inoculation, produced by the cow's lying down in a meadow where the affected horse had been previously feeding, and her udder coming in contact with the discharge which had dripped on the grass and lodged there: and he endeavoured to show the identity of the fluids by the identity of their effects in respect of the smallpox. So far as can be judged from the few cases before us, performed, indeed, in different countries, but still few in respect to the number necessary to establish a positive proof, greasepox seems to have succeeded as well as cowpox; and hence blacksmiths and farriers who have been infected by the grease, have been for ages considered as generally unsusceptible of variolous contagion; and it is possible, therefore, that there may be, as already observed, other animal poisons possessed of a similar power. But it is not necessary to search for them; none can surpass and none be expected to equal the cowpox process in respect to cleanliness, simplicity, and little disturbance to the system; while, on the contrary, the mere idea of using the matter of grease from the horse's heel, excited from the first so deep and extensive a disgust, that cowpox inoculation had nearly fallen a sacrifice, from the supposed union of the two diseases. It was fortunate, therefore, for Dr. Jenner, and the triumph of his discovery, that a minuter attention to the subject gave sufficient proof that there was no foundation for his opinion; and that, whatever be the pro-

phylactic power of the matter of the disease called grease, this disease is by no means the origin of the natural cowpox, and has no connexion with it.

[To the foregoing account the editor subjoins a summary of certain important inferences, deduced from the researches of Dr. Thomson, Mr. Cross, Dr. Stoker, Dr. Barnes, and others, as laid down by the anonymous critic already quoted.—(*Edin. Med. Journ.*, No. lxxxix.)

1st. Though the action of cowpox on the human body renders it very nearly, if not altogether, unsusceptible of inoculated smallpox, it does not extinguish its susceptibility of smallpox through the medium of atmospheric contagion, particularly when the disease prevails extensively as an epidemic.

2dly. The action of cowpox diminishes this susceptibility very considerably, and (mostly) renders the action of smallpox on the human body, when it takes place, much less severe; changing very completely the character of the disease, and depriving it of its usual malignity. —(*Thomson*, p. 87.)

3dly. One attack of smallpox diminishes, but does not extinguish, the susceptibility to a second attack in the same individual. This second attack may appear either in the form of regular smallpox, or in the anomalous or spurious forms to which the names of chickenpox, sheeppox, swinepox, siliquosepox, bladderpox, &c., have been applied. In general, if the first attack is regular smallpox, the second is one or other of the irregular forms, and *vice versâ*. Early life predisposes to these attacks.

4thly. The full and complete action of cowpox diminishes the susceptibility to smallpox, and, in the majority of cases, modifies its action in a much greater degree than a previous attack of smallpox itself does. No facts warrant the conclusion, that this modifying or controlling influence of the vaccine action is altered by the interval of time from the date of vaccination. —(*Thomson*, p. 34.)*

5thly. While the practice of inoculating smallpox continues, it is injurious in perpetuating and disseminating the infection of a dangerous, severe, and not unfrequently a fatal disease.

6thly. The substitution of cowpox, by diminishing the extent of the operation of this infection, tends indirectly to diminish the disease generated by it, and the evils resulting from it.†]

SPECIES IV.

EMPHLYSIS VARICELLA

*WATERPOX.**

VESICLES SCATTERED OVER THE BODY; GLABROUS; TRANSPARENT; PEA-SIZED; IN SUCCESSIVE CROPS WITH RED MARGINS; PELLICLE THIN; ABOUT THE THIRD DAY FROM THEIR APPEARANCE BURSTING AT THE TIP, AND CONCRETING INTO SMALL PUCKERED SCABS, RARELY LEAVING A CICATRIX.

THE waterpox appears under the four following varieties, distinguished chiefly by the shape of the pimple:—

α	Lentiformis. Chickenpox.	Vesicles lentil-shaped, or irregularly circular, flattened at the top; fluid at first pellucid, then whitish; afterward straw coloured.
β	Coniformis. Swinepox.	Vesicles acuminated; fluid pellucid throughout.
γ	Globularis. Hives.	Vesicles globular and larger; fluid at first wheycoloured, afterward yellowish.
δ	Corymbosa. Clustering waterpox.	Vesicles clustering upon a common, but broader base; redder at the first, and later in appearance; febrile symptoms outlasting the eruption.

Several of the varieties are sometimes intermixed, and the fluid, about three days after the eruption, occasionally becomes thickish as well as yellowish in the first and third, and possesses a purulent appearance (*Frank, De Hom. Morb.*, tom. ii., p. 170); whence, in various instances, they have been mistaken for smallpox. The eruptive fever in chickenpox is also sometimes considerable; and hence another cause of the same mistake, a mistake that has not unfrequently led to serious and even fatal consequences, by putting those who have had the disease off their guard against variolous infection. And where this error has been committed, and the smallpox has afterward been received, it has led to a second mistake, by inducing the patient to believe that he has had the smallpox a second time.

The two diseases, indeed, were long confounded by physicians of the highest character: they were regarded alike by Morton; and even in Sauvages, varicella is described under the name of *variola lymphatica*.† This, however, is a subject we shall further examine into under

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* Some doubts on this subject are entertained by some respectable American practitioners, and hence they recommend vaccination after a certain period; but those who have had the best practical opportunities for studying this disease, are of opinion that vaccination, *when properly performed*, requires not to be repeated.—D.

† By many persons cowpox is believed to be nothing more than a modification of smallpox, which is a disease that will certainly affect the cow. Clothes have been taken from patients labouring under smallpox and laid on cows, and they have had the disease called cowpox. If, then, vaccinia be really smallpox modified, we cannot wonder, as Dr. Elliotson has observed, that it should generally afford immunity from the latter disease to those who have once had it. The cowpox, however, is far milder than smallpox, and strictly a contagious disease, not, like the latter, infectious.—See Dr. Elliotson's Lect. at Lond. Univ., as published in Med. Gaz., vol. xi., p. 305. —ED.

* Little Smallpox.

† See upon this subject the remarks under Empyesis Variola, or Smallpox, Gen. III., Spec. 1, of the present Class and Order.

SMALLPOX.* Suffice it for the present to observe, that varicella is *adequately* ascertained to originate from a peculiar specific contagion; and the characters by which it is sufficiently distinguished from smallpox are, that its fluid, except in a few anomalous cases, is limpid throughout; the disease, in short, is vesicular; and that, as early as the third or fourth day from the eruption, it concretes into crusts, which are thrown off without indenting the cutis;† while, in smallpox, the fluid consists of pus as soon as formed, and does not concrete into crusts till the seventh day, and often much later. Like the smallpox, it does not attack the same person a second time, excepting in a few anomalous constitutions, that establish rather than oppose the general rule. "I wetted a thread," says Dr. Heberden, "in the most concreted pus-like liquor of the chickenpox which I could find, and, after making a slight incision, it was confined upon the arm of one who had formerly had it: the little wound healed up immediately, and showed no signs of any infection."—(*Medical Transactions*, vol. i., art. xvii.)

In the ordinary course of the first three varieties, the pyrectic symptoms are so slight as not to require medical attention; and sometimes there is no fever whatever. The eruption makes its appearance chiefly on the back, and is often confined to it; and the number of vesicles varies from 20 to 200. I have sometimes, however, known the eruption preceded by almost as severe febrile signs of shivering, sickness, headache, and pain in the limbs, as that of smallpox, but the symptoms have always subsided when the vesicles have appeared.

In this case an active purge should be administered, succeeded by some diluting drink; and the patient should be confined to a quiet, spacious, and well-ventilated room, with a cool dress, till the febrile symptoms have left him.

For the fourth variety I am entirely indebted to the observant and indefatigable eye of Dr. Heberden; for it has never occurred to me, nor is it to be found in the table of the Nosologists. "This disorder," says he, "is preceded for three or four days by all the symptoms which forerun the chickenpox, but in a much higher degree. On the fourth or fifth day the eruption appears, with very little abatement of the fever; the pain likewise of the limbs and back still continues, to which are joined pains of the gums. The pocks are redder than the chickenpox, and spread wider, and hardly rise so high, at least not in proportion to their size. Instead of the little head or vesicle of the serous matter, these have from four to ten or twelve. They go off just like the chickenpox, and are distinguished from the smallpox by the same marks; besides which, the continuance of the pains and fever after the eruption, and the degree of both these, though there be not above twenty pocks, are, as far as I have seen, what never happen in the smallpox."—(*Med. Trans.*, ut suprà.)

* Gen. III., Spe. 1, of the present Order, Empyesis Variola. With regard to the question, whether varicella is only a mild and modified form of smallpox, Dr. Elliotson thinks that we are not in possession of all the information required to enable us to deliver a positive opinion.—ED.

† After this disease Dr. Elliotson has frequently seen ecthyma, and rupia, and pitting take place, in the same manner as after smallpox. He had the smallpox himself, and was not pitted at all; but the chickenpox came afterward, and left several pits.—See Lect. at Lond. Univ., as published in Med. Gaz., vol. ii., p. 308.—ED.

SPECIES V.

EMPHLYSIS PEMPHIGUS.

VESICULAR, OR BLADDERY FEVER.

VESICLES SCATTERED OVER THE BODY; TRANSPARENT; FILBERT-SIZED; WITH A RED INFLAMED EDGE, BUT WITHOUT SURROUNDING BLUSH OR TUMEFACTION; ON BREAKING DISPOSED TO ULCERATE; FLUID PELLUCID, OR SLIGHTLY COLOURED; FEVER A TYPHUS.

THE term *pemphigus* is derived from the Greek πεμφιξ, "flatus, bulla," and hence *inflation*, bladder, bubble. The idea of flatulence, however, is seldom connected with this disease in modern medicine, though very generally in ancient. The term, in the sense in which it is now commonly understood, was perhaps first employed by Sauvages, and has since passed into common use. It is still doubted by many, whether pemphigus is entitled to be considered as a distinct and idiopathic disease; and whether all its varieties and modifications may not resolve themselves into certain peculiarities of erysipelas or pompholyx, the latter of which consists of similar vesicles, or bullæ, without fever; or into mere symptoms of typhus or plague. Gulbrand appears to have been of the former opinion; and hence he has denominated the disease *erysipelas vesiculare* (*Act. Soc. Med. Hafn.*, tom. i.): Dr. Cullen seems to have been of the latter at the time of drawing up his definition, and still later, at that of drawing up his First Lines, in consequence of which he dismisses it, in a single paragraph, as an affection concerning which he can say nothing. But the fourth edition of his Synopsis contains a subjoined note, which intimates that his opinion was altered in consequence of having seen a patient shown him by Dr. Home, and who was labouring under this disease, as an idiopathic affection, at the time. And when to this we add the authority, not merely of the earlier writers, Bontius, Seliger, and Langhans, but of Frank, Withers, Clarkson, Christie, Ring, Braune, and Dr. Stewart of Aberdeen, it would be unpardonable not to allow it a distinct place in a general system of nosology.*

* Pemphigus may make its appearance as an idiopathic disease, or as sympathetic of some visceral inflammation; or its bullæ may occur during the course of other diseases, more especially those of the skin, principally erysipelas, herpes, prurigo, scabies, and varicella. It is asserted by some writers, that the bullæ of pemphigus are occasionally found on the mucous membrane of the stomach and intestines. Rayer admits the occasional existence of bullæ on the mucous mem-

Upon a careful review it appears to offer the three following varieties, which run parallel with those of Dr. Willan, though not exactly taken from him :—

α Vulgaris. Common vesicular fever.	Vesicles appearing on the second or third day, occasionally not till the fifth or sixth; in successive crops: often extending over the mouth and intestinal canal; fluid, on bursting, yellowish; some of the vesicles livid, with a livid base.
β Glandularis. Glandular vesicular fever.	Preceded by tumefaction of the neck and throat; vesicles chiefly seated on the fauces and conglobate glands; occasionally producing abscesses; highly contagious.
γ Infantum. Infantile vesicular fever.	Vesicles irregularly oblong, with livid edges and commonly flattened tops; appearing successively on different parts of the surface of infants a few days after birth; on breaking, purplish.

We shall have occasion to observe, under VARIOLA, that Frank, who made a different division of pemphigus, undertook to include under it varicella, crystalline, and hornpox, and many of the forms of disease which have been denominated spurious smallpox.

The FIRST VARIETY, or common pemphigus, is the *pemphigus major* of Sauvages, a very marked case of which is given in a communication of Dr. David Stewart to Dr. Duncan of Edinburgh.—(*Edin. Med. Comment.*, vol. vi., p. 79.) It appeared on a young private of the seventy-third regiment, who had for a fortnight or three weeks antecedently been unwell from a sudden retrocession of measles, produced by an exposure to cold, and afterward to a damp unventilated apartment. He was received into the hospital at Aberdeen April 15, at which time he complained of headache, sickness, oppression about the præcordia, thirst, sore throat, difficulty of swallowing; his tongue was foul, his skin hot, pulse from 110 to 120, rather depressed. The whole surface was interspersed with vesicles of the size of an ordinary walnut; especially the breast and arms. In the interstices, the appearance of the skin was natural; and the distance from one vesicle to another was from half an inch to a hand's breadth or more. The disease did not seem to be contagious, as the patient was a solitary instance of it, both where he resided before and after his reception into the hospital. His chief medical treatment consisted in bark and port wine, with acidulated drinks; many of the vesicles broke, and discharged a bloody and most offensive ichor; the cutis, upon a rupture of the vesicles, was for the most part sound, of a deep-red hue, and in some places livid. A new cuticle was gradually produced: and on April 27, being twelve days from his reception into the hospital, he was dismissed perfectly cured.

In this case the bullæ do not seem to have reached below the throat in an internal direction, nor lower than this region in the severer case described by Seliger. In the first instance the vesicles appeared abruptly, and had burst and were healed in seven or eight days. In Seliger's case they issued more gradually, and in successive crops, ran through a longer period, and were not healed till the twenty-first day.—(*Ephem. Act. Nat. Cur.*, dec. i., ann. viii., obs. 56.) Dr. Frank gives a case of a like kind, that continued to migrate over different parts of the body for sixteen days, accompanied with difficulty of breathing, subsultus, and pain at first in the region of the liver, but afterward in the chest, assuming the guise of peripneumony.—(*De Cur. Hom. Morb. Epit.*, tom. iii., p. 266.) In a case apparently of the same kind, published by Dr. Dickson, there is evident proof of the disease having extended from the fauces throughout a considerable part of the alimentary canal: here also the vesicles appeared in successive crops, especially on the ninth, tenth, and thirteenth days, each crop continuing four or five days before it burst; the fever was accompanied with delirium, but abated on the fifteenth day on the appearance of the catamenia, and the bullæ healed in succession without any trouble.—(*Trans. of Royal Irish Acad.*, vol. i., 1787.) None of these appear to have been contagious.*

I cannot speak of pemphigus from personal knowledge; but in all the above instances, the fever was of a low or typhous type; and the disease seems to have approached the nature of erysipelas, and was treated successfully by the means usually employed for the latter.†

For what little knowledge we possess of the SECOND OR GLANDULAR VARIETY, the contagious pemphigus of Dr. Willan, we are chiefly indebted to Dr. Langhans, a Swiss physician, who observed it in the spring and through the summer of 1752, in the lowlands of his own

brane of the mouth, but denies their existence in the stomach and intestines. The case recorded by Dr. Dickson disagrees with Rayer's view, though it was certainly unconfirmed by any post-mortem examination, the patient having recovered.—Dr. Corrigan in Cyclop. of Pract. Med., art. PEMPHIGUS.—ED.

* In the abdominal viscera, the changes most frequently observed in fatal cases of pemphigus are redness, softening, and ulcerations; the ordinary effects of gastro-enteritis.—Dr. Corrigan, op. cit.

† According to Dr. Corrigan, the fever which sometimes precedes or accompanies the bullæ of pemphigus, makes no approach to the regularity of the fevers of measles or scarlatina; but is, on the contrary, very irregular in its nature and duration. It may be a short inflammatory fever, or of a low typhoid type, or it may assume the characters of an intermittent. The period of the fever, when the eruption occurs, seems also to be equally uncertain.—See Cyclop. of Pract. Med., art. PEMPHIGUS.—ED.

country.—(*Act. Helvet.*, tom. ii., p. 260.) It commenced with a sense of tension in the fauces, and a slight pain spreading behind the ears to the anterior part of the thorax, accompanied with the symptoms that mark the first stage of fever, but not succeeded by a hot fit. A greenish bilious matter was sometimes thrown up from the stomach, and the pulse was feeble. The neck swelled externally and internally about the fauces, bullæ were observed of the size of a filbert, producing little pain, and containing a yellow ichor of an offensive smell. Soon afterward similar vesicles were found scattered sparingly over the body and limbs, which, if not broken or opened, collapsed on the second, third, or fourth day, and dwindled into whitish crusts. During this period the tumour of the neck often suppurated, or other suppurating tumours formed in some of the conglobate or conglomerate glands, as the parotid, axillary, or inguinal; and the virus of the disease being thus discharged by different outlets on the surface of the body, the patient recovered. But if, before this translation to the surface, there were a sense of weight and anxiety about the thorax, a large abscess was formed internally, and on its bursting the patient died from suffocation. Or, if the matter lodged in the external vesicles were by accident repelled before any glandular suppuration took place, he died almost as suddenly.

M. Langhans compares this disease to syphilis, but apparently with little reason; and Dr. Cullen and Dr. Frank, with not much more, to *rosalia paristhmitica*. The cause, like that of the sweating sickness, is altogether unknown, and like this disease also, after having ravaged with great fatality for a certain but a shorter period of time, happily for Switzerland, and perhaps for all Europe, it vanished, and has been heard of no more. Sauvages, indeed, quotes a description of pemphigus from Thiery, which, by some writers, has been supposed to be the same; but the account is so brief, and at the same time so loose and indistinct, that it is impossible either to arrange or reason about it.

The glandular pemphigus of Switzerland, according to M. Langhans, was both contagious and epidemic; so contagious, indeed, as to spread through numerous families with great rapidity, and so malignant, that all persons affected by it died. This last assertion, however, compared with what follows, appears to be a little overcharged; for the author proceeds, as already observed, to point out under what circumstances patients recovered from it; and lays down a remedial process, which, "though at first," says he, "I employed it with anxiety and hesitation, I can now with pleasure recommend to all persons labouring under the complaint, with the most sanguine hope that it will effect a speedy cure."

This successful practice, as in the sweating sickness, consisted in exciting a strong determination to the surface by active sudorifics; and at the same time supporting the strength with camphire and other cardiacs. He commenced his process, however, by venesection, which was sometimes repeated, and where there was danger of an abscess in the lungs, unquestionably with great judgment.

The INFANTILE PEMPHIGUS* appears, as already noticed, most commonly a few days after birth; but in one case adverted to by Dr. Willan, as late as ten months after this period. The vesicles show themselves on the neck, upper part of the breast, abdomen, groin, scrotum, and inner parts of the thighs. They arise successively, break, and expose a surface that heals with difficulty, and more generally enlarges its boundary, and wears out the little patient with pain, restlessness, and want of sleep. Warm cordials, as camphire and the aromatic confection, with a little port wine negus, form the best means of supporting the strength; and laudanum must be had recourse to where the want of sleep requires it.

SPECIES VI.

EMPHLYSIS ERYSIPELAS.

ST. ANTHONY'S FIRE.

VESICATION DIFFUSE; IRREGULARLY CIRCUMSCRIBED; APPEARING IN A PARTICULAR PART OF THE BODY, CHIEFLY THE FACE, ABOUT THE THIRD DAY; WITH TUMEFACTION, AND ERYTHEMATIC BLUSH: FEVER USUALLY ACCOMPANIED WITH SLEEPINESS, OFTEN WITH DELIRIUM.

In describing the genus erythema, I endeavoured to point out a distinctive line between that inflammation and erysipelas, which are so often intermixed and confounded even by good writers; and observed that the first bears the same analogy to phlegmon as the last to smallpox. Phlegmon is local inflammation tending to suppuration; erythema local inflammation tending to vesication: smallpox is an idiopathic fever producing a phlegmonous efflorescence; erysipelas an idiopathic fever producing an erythematic efflorescence. Smallpox is always contagious: erysipelas occasionally so: phlegmon and erythema have no such tendency.

[The plan of classing erysipelas with the exanthemata does not receive the universal sanction of medical writers. In particular, Mr. Lawrence does not concur in its propriety. "If we were," says he, "to construct a natural arrangement of diseases, we should, perhaps, find sufficient reason for separating erysipelatous affections altogether from the febrile exanthemata. The latter form a natural order, well characterized by the fever preceding the local disease, by their origin from a single specific cause, namely, contagion, by their regular periods of efflorescence and decline, their definite duration, and by their generally affecting an individual only once in his life. Erysipelas (here, it is to be observed, Mr. Lawrence uses the term in the sense of the author's erythema) arises from various causes, among which it is doubtful whether contagion is to be included; it is often

* Sometimes named *gangrenous pemphigus;* it is the rupia escharotica of Bateman and Biett. Dr. Corrigan describes, under the name of *chronic pemphigus*, what Bateman calls *pompholyx diutinus*, and Alibert *dartre phlyctenoide confluente*.—Ed.

not preceded by fever; its course is various and uncertain, its duration indefinite, and it attacks the same individual repeatedly."—(*Med. Chir. Trans.*, vol. xiv., p. 34.) Now, although the erysipelas of Dr. Good is, in imitation of Cullen, restricted to the febrile disorder that is followed by erythema, or erysipelatous inflammation, as an effect, it must be admitted that it wants many of the striking features pointed out by Mr. Lawrence as characterizing exanthemata in general. At the same time, the distinction of erysipelas as a fever leading to erythema, or erysipelatous inflammation, as a regular event, ought undoubtedly to be discriminated from other cases, in which the local affection comes on first, and whatever disturbance of the system ensues is merely the effect of it.]

The varieties of this species are very differently given by different writers; by many of whom they are multiplied most unnecessarily. Dr. Cullen makes even the *herpes Zoster*, or shingles, a variety: but this is strangely to confuse simple cutaneous diseases with idiopathic fevers. For that erysipelas, when genuine, is an idiopathic fever, dependant upon or productive of a specific virus, is clear, because it has often, though not generally, been found contagious, and is capable of propagation by inoculation. "When the acrimonious lymph," observes Dr. Willan, "contained in the phlyctænæ or vesications of a genuine erysipelas is inoculated or casually applied to any slight wound in a person otherwise healthy, it produces febrile symptoms, with a red and painful, but diffuse swelling, analogous to that of the disease from which the virus was derived."—(*On Cutaneous Diseases*, p 514.) And he has added a case, in which the mother of a young girl, severely affected with this disease, appears to have received it in consequence of having nursed her.

Dr. Wells has strengthened the doctrine of its contagious property by a variety of facts and cases, that can scarcely, I should think, be read by any one without conviction.—(*Trans. of a Soc. for the Impr. of Med. and Chir. Knowledge*, vol. ii., p. 213.) One of his examples extends to four individuals, who received the disease in succession, after direct contact or near approximation with each other; and another gives us a like chain of not less than six in descent, all of whom, indeed, he did not attend personally, but the history of whom, as communicated to him by one of the affected, was confirmed by Dr. Pitcairn, who had been consulted by two of the rest, and was privy to the general fact. Dr. Pitcairn also communicated to Dr. Wells the following highly important statement in addition:—"A lady, immediately after delivery, was attacked with a fever, which was accompanied with an affection of her skin somewhat like erysipelas; her child, about three days after its birth, was seized with that species of erysipelas the French call *la gelure*, which first appeared about the pudenda, and afterward extended itself to other parts of the body, among the rest to the face. Both the lady and her child died, after a few days' illness; and about eight days after the death of the child, the lady's mother and servant-maid, both of whom had attended it during its illness, were attacked with erysipelas of the face, from which both of them recovered." The opinion of Dr. Baillie, as communicated to Dr. Wells on another occasion, is to the same effect; to which Dr. Baillie seems to have been more especially led, by having observed in "a part of the years 1795 and 1796, that the erysipelas of the face was much more frequent in St. George's Hospital than he had ever before known it to be: that many persons were attacked after they came into the hospital, and that the number in a particular ward was much greater than in any other."*

This last remark seems to give some countenance to the further opinion that erysipelas becomes occasionally an epidemy, or operates through the medium of the atmosphere, as well as by direct contact; though, whether the atmosphere, in this case, be impregnated with the specific miasm of the disease, or merely predisposes the body to a more ready generation of it, has no more been determined than in the case of various other exanthems that evince a like power. Dr. Parr asserts broadly, "we have four times seen it epidemic; and more than once we have had reason to suspect that it was communicated by infection."†

At first sight it might seem easy from these accounts to subdivide erysipelas into the two varieties of contagious and uncontagious; but,

* See also "Cases illustrating the Contagious Nature of Erysipelas, and its connexion with a severe Affection of the Throat," by J. Stevenson, M. D., in Edin. Med. Chir. Trans., vol. ii.

† Dict. in verbo. The doctrine of erysipelas being contagious is much more doubted at the present day than that of its being sometimes epidemic, and prevailing extensively in particular situations, seasons, and states of the atmosphere. Some of the cases published by Dr. Stevenson, of Arbroath, to illustrate the contagious nature of erysipelas (see Edin. Med. Chir. Trans., vol. ii., p. 128, et seq.), appear to the editor to be only an epidemic form of sore throat, sometimes involving the larynx, as described by Bretonneau, and noticed in this work, under the head of bronchlemmitis. The possibility of any textures, except those of the integuments, being truly the seat of erysipelatous inflammation, is doubted by Mr. Lawrence. The editor, however, will not venture to deny Mr. Hunter's position, that, when there is a tendency to this form of inflammation in the habit, every inflammation, whether external or internal, may partake of its character in some respects, and be, for instance, more disposed to spread. Mr. Hunter's opinion, perhaps, has received some support from three cases mentioned to the Medical and Chirurgical Society of Edinburgh, by Dr. Abercrombie, Dr. Hay, and Mr. Bryce, where the inflammation appeared to have spread from the fauces to the external surface, the part of the skin first affected having been, in the first two cases, at the orifice of the nostrils, and, in the last, at one of the lachrymal ducts.—(See Edin. Med. Chir. Trans, vol. ii., p. 135.) The facts published by Dr. Wells, and some others by Mr. Bury, of Farnham (Med. Gaz., July, 1833), are among the strongest adduced in support of the occasionally contagious nature of erysipelas.—ED.

as it is most probable that the power of communication depends alone upon the peculiar diathesis of the person who receives it, as being endowed with a susceptibility of the disease not possessed by others, we can make nothing of this discrepance: and shall hence examine it under the following varieties, founded upon other circumstances:—

α	Locale. Local erysipelas.	Limited to a particular part; cuticle raised into numerous aggregate distinct cells; or the cells running into one or more blebs or large blisters.
β	Erraticum. Erratic erysipelas.	Travelling in successive patches from part to part: the earlier patches declining as new ones make their appearance.

Local erysipelas generally exhibits itself on one side of the face, or on one of the limbs. In the former case, the disease begins with coldness and shiverings, which alternate with irregular flashes of heat, and other symptoms of pyrexy. Dull aching pains are felt in the head, neck, and back. The swelling usually appears in the course of the second night or the third day; though I have sometimes known it take place within a few hours after the attack: the redness disappearing when pressed upon by the finger, but returning as soon as the pressure is removed. The eruption fixes on one side of the nose, or the cheek, temple, or forehead; is of a dark-red colour, smooth and soft, and attended with a sensation of heat and tingling. The redness and swelling extend gradually over the affected side of the face; and spread, in some cases, to the scalp, and to the side of the neck, or the upper part of the breast. Hence the face appears much disfigured; the mouth is drawn to one side; the eyelids are turgid, and close up the eye; the fever increases, and is often attended with delirium. On the fourth and fifth day vesications arise on idfferent parts of the diseased surface, especially about the centre; but with an increase rather than a diminution of the fever. The vesicles or bullæ are of different sizes, and have an irregular base. The fluid contained in them is at first clear and watery; it afterward becomes straw-coloured or opaque, occasionally slightly livid, without losing its transparency. The cuticle gives way in a few places, and the fluid oozes through the cracks. About the eighth or ninth day, and sometimes sooner, the redness changes to a brown or yellowish hue, the bullæ subside, and the cuticle dries and desquamates, or scales off. Occasionally, both sides of the face are affected at the same time; but sometimes the morbid half is separated from the sound by an exact line drawn across the forehead, down the middle of the nose to the chin. The fever subsides about the eighth or ninth day, but sometimes after its cessation it returns suddenly with as much violence as at first, and continues two or three days longer. A sanious fluid, approaching the nature of pus, is sometimes found in parts of the vesication: and from this circumstance Dr. Cullen has distinguished one variety of the disease by the name *of erysipelas phlegmonodes:* and has been copied by Dr. Willan. "A circumscribed cavity," says Mr. Pearson, "containing laudable pus, is never seen in the legitimate erysipelas.* Where a purulent effusion happens in any considerable degree, it affords, when the part is examined, a sensation similar to that excited by a quagmire or morass. In that sort of suppuration which sometimes supervenes to erysipelas, the cellular membrane suffers great injury, and not uncommonly the part is in a gangrenous condition."—(*Principles of Surgery*, § 289.)

When the head is the seat of disease it occasionally swells to an enormous magnitude, and when the case is attended with delirium, it sometimes proves fatal. [Often, particularly when the head is the seat of erysipelas (says Mr. Lawrence), the sensorium is principally affected, and there is pain and oppression of the head, sleepiness, coma, or delirium. The tongue in such cases becomes dry and brown; but this is frequently owing principally to the circumstance of the patient breathing entirely through the mouth; the pulse is rapid and feeble, and there is great loss of muscular strength; in short, the symptoms at length are those called typhoid. In other cases, the circulation and the nervous system are not much affected; but there are many indications of disordered stomach and bowels, to which the origin of the local affection must be ascribed. But, as the same gentleman has remarked, the local symptoms are preceded and accompanied by fever, which always varies in its character, according to the constitution, age, and general state of health. In the young, strong, and those of full habit, it is decidedly of an inflammatory character; and blood drawn from a vein exhibits the buffy coat in a greater or less degree. In phlegmonous erysipelas, the general and local symptoms are more violent than in simple erysipelas; the redness is deeper, and the tumefaction more considerable; the whole depth of the adipose and cellular textures being loaded with effusion, so that an arm or leg appears of twice the natural size.—(*Lawrence, in Med. Chirurg. Trans.*, vol. xiv., pp. 6–9.) As this form of the complaint frequently does not vesicate, and often arises from local injuries,

* The opinion that true pus is never formed in phlegmonous erysipelas is contradicted by daily experience; but that the pus is very seldom contained in a circumscribed cavity is a fact particularly noticed by Mr. Hunter. Yet, in phlegmonous erysipelas, as Mr. Lawrence has pointed out, matter is frequently deposited in small separate collections, dispersed irregularly in the cellular texture. While erysipelas is what Mr. Lawrence calls *simple*, that is, confined to the skin, and does not materially affect the subjacent cellular membrane, suppuration does not take place. "It may, however," says Mr. L., "become more severe at one point; and thus we occasionally see the formation of abscess under the skin towards the decline, or after the appearance, of the general erysipelatous redness."—Med. Chir. Trans., vol. xiv., p. 5.—Ed.

perhaps it cannot properly be classed with St. Anthony's fire, or the erysipelas of our author; but rather belongs to his cases of erythema.] The disturbance of the constitution is generally less violent when the erythema appears in the extremities, than when it attacks the head. The limbs most affected are the legs, in which, probably from their depending situation, the vesications fill rapidly, and break within twenty-four hours from their first appearance. Salmouth relates a case in which the intumescence extended over the entire frame (Cent. i., obs. 32): but this is extremely rare, excepting under the second or migratory form, in which it trails over different parts in succession, till the whole body has been affected.

In the ERRATIC VARIETY, the complaint usually, and particularly in adults, begins its attack in the face, and spreads in succession to the extremities, the patch first formed healing as fresh ones appear below. Sometimes, however, other parts are seized first; and perhaps more frequently so when this variety shows itself in infants; for here the parts about the navel are usually first affected, and the disease winds downward to the sexual organs, which are often very considerably tumefied and inflamed. What, however, is usually denominated the infantile erysipelas, is more commonly a variety of gangrenous erythema, produced, in many instances, by the want of cleanliness, pure air, and nutritive food. The inflammatory blush soon assumes a livid hue, and is sometimes covered with or surrounded by petechiæ: the cuticle is separated to a considerable extent from the cutis, breaks, and exposes a foul and ulcerating surface that almost immediately passes into a state of gangrene. In some instances, nevertheless, these cutaneous efflorescences are probably accompanied with a true erysipelatous fever; for, in lying-in hospitals, the disease is said to have proved occasionally contagious.

The *erysipelas œdematodes* and *e. gangræ-nosum* of Dr. Willan appear to be misnamed, and consequently misplaced. They are more accurately erythemata, and have already been described under the species *erythema œdematosum* and *e. gangrænosum*.

The usual causes are cold, intemperance, suppressed perspiration, and the other common excitements of fever operating upon an erythematic diathesis, and producing therefore this peculiar efflorescence in connexion with the febrile attack. In *almost* every instance, there is evidently a diminished vascular action; and hence we meet with the disease far most frequently in persons of delicate habits, women, children, and those who have long resided in warm climates. In one instance, it has occurred to me in a strong hearty man, of plethoric form and sanguineous temperament, well known to the world as a public character; but in this case the diet had, from the patient's boyhood, been exclusively that of vegetables.

[In the preceding paragraph our author is speaking, it is to be remarked, not of the causes of the erysipelatous inflammation, but of the fever which induces it as a regular effect, and to which he particularly restricts the term erysipelas. In this particular instance, whatever excites the specific fever, whatever state of the constitution imparts to the general disturbance of the system the peculiarity of its being always followed by the erythema, or erysipelatous inflammation of the skin, must be considered as the cause of the disease. This cause we know not, unless it be admitted, which is not commonly believed, that St. Anthony's fire either depends upon contagion, or, as Dr. Good has said, the usual causes of fever operating upon an erythematic diathesis. The inquiry, therefore, if pursued further, would be into the foundation for the doctrine of contagion, and into the circumstances producing an erythematic diathesis, or, in plain language, a disposition to erysipelatous inflammation. It is certain that the fever to which Dr. Good restricts the name erysipelas, is frequently connected with disorder of the liver and stomach.]

It has occasionally happened, and especially where the disease has occurred as an epidemy in some of the high and healthy villages of North Britain, in the heat of a dry summer or autumn, that, instead of diminished vascular action, there has been such a degree of entony and caumatic fever as to call for free venesection from the first, and of this form a few striking examples have been communicated to the author. So, on the contrary, the smallpox and measles, though ordinarily accompanied with cauma, occasionally evince a typhous type, and demand a tonic plan of procedure.

The mode of treatment may be expressed in few words. Venesection was formerly recommended as a part of the ordinary plan, and has been so of late by a few writers. Yet this is to act without discrimination, and to mistake the exception for the general rule. Passing by the modification just adverted to, and those occasional congestions in the larger organs, and especially in the head, which, even in typhus, and still more in such forms of erysipelas, demand a prompt and repeated use of bloodletting, I can conceive very few ordinary cases, in which the lancet has a chance of being serviceable; while the application of leeches always exasperates the efflorescence. As a general plan, we should first cool the body by gentle laxatives, and instantly have recourse to a tonic plan. The bark given largely, as long since warmly and judiciously recommended by Bromfield (*Med. Communications*, ii., 4) and Colly (Id., ii., 3), has rarely failed of success. Dr. Fordyce was in the habit of giving it, in a dangerous state of the disease, in the proportion of a drachm of the powder every hour. He tried it for twenty years, and with growing confidence. Where, however, there is much evening or night exacerbation, it may temporarily be dropped for some warm diaphoretic, as camphire, with small doses of James's powder, or the spirit or compound spirit of sulphuric ether, in saline draughts made with the subcarbonate of ammonia. If the head be much affected, it should be lightly covered with linen wetted

constantly with vinegar and cold water, or equal parts of water and the solution of acetated ammonia: and, if the vesications ooze, they should be frequently dusted with finely-powdered starch, or a powder consisting of half starch and half calamine. The diet should be light and of easy digestion. Opiates have rarely succeeded in procuring sleep; and have generally added to the mental irritation.

[From the foregoing observations it appears, that the author was much under the influence of the doctrine, that the fever, called by him erysipelas, and all kinds of erysipelatous, or, as he terms it, *erythematic* inflammation, are essentially connected with diminished vascular action and debility. Hence his general preference to tonic and stimulating remedies. After what has been explained under the head of *erythema*, in a previous section of this volume, p. 450, et seq., it is unnecessary to insist upon the fact, that the local affection is always of an inflammatory nature; that, abstractedly viewed, it requires antiphlogistic treatment; but that, whether this plan should be adopted or not, must depend upon the stage of the disease, the patient's strength and age, and the type of the fever, whether caumatic or typhoid. Strong, young, and plethoric persons are more frequently attacked with the fever, here implied by *erysipelas*, than our author's remarks would lead us to suppose: and in all such examples, antiphlogistic treatment, including general and local bleeding, purgatives, low diet, &c., is indicated. The application of leeches to erysipelatous parts is found to be perfectly safe. The editor has frequently seen five or six dozen leeches put on the head and face in the course of the first week of the disorder. Nor should free and even repeated venesection be omitted, when the patient is young, strong, or plethoric. An emetic is also frequently of great service in the beginning of the disease, particularly when there is a bitter taste in the mouth, attended with headache and derangement of the stomach.

Emetics must not be employed at random: when the tongue is red, and the thirst excessive, they do harm; when there are no symptoms of disorder of the stomach, they are neither hurtful nor beneficial; but when there is bitterness in the mouth, the tongue has a thick white or yellowish fur upon it, without any subjacent or surrounding redness, and the patient has nausea and eructations, which have the smell of sulphurated hydrogen, emetics are really of great service.—(*Andral, Anat. Pathol.*, tom. ii., p. 224.)]

GENUS III.
EMPYESIS.
PUSTULOUS EXANTHEM.

ERUPTION OF PHLEGMONOUS PIMPLES; GRADUALLY FILLING WITH A PURULENT FLUID; AND TERMINATING IN THICK SCABS, FREQUENTLY LEAVING PITS OR SCARS.

Empyesis is a term of Hippocrates, and is to be found in the fifth book of his Aphorisms. It is derived from the Greek ἐμπύω, or ἐμπύω, "suppuro." The Greek writers also use, and perhaps more generally, ecpyésis, from ἐκπύω, of similar meaning. The same distinction between the terms is made in the present system, as between emphlysis and ecphlysis: the former being limited to signify pustular eruptions produced by *internal* and febrile affection, and the latter to signify those that are merely cutaneous or *superficial*, or with which *internal affection is not necessarily* associated.

The genus EMPYESIS contains not more than a single species that has yet been discovered, and that is—

Empyesis Variola.. Smallpox.

SPECIES I.
EMPYESIS VARIOLA
SMALLPOX.

PUSTULES APPEARING FROM THE THIRD TO THE FIFTH DAY; SUPPURATING FROM THE EIGHTH TO THE TENTH: FEVER A CAUMA: CONTAGIOUS.

When the smallpox first made its appearance in the world, we know not. There is no substantial ground for believing that the *disease* was known to the Greeks or Romans. It has been thought, indeed, by some persons, that the former have glanced at it under the name of anthrax or anthrace (*Hahn, Variolorum Antiquitates è Græcis erutæ*, 1734); but the idea is too wild for serious refutation. It is far better ascertained that it existed in Asia, and especially in China, for an incalculable period before it was known in Europe; and, from the accounts of the Jesuits, to which we shall have to refer more particularly presently, it is highly probable that the art of inoculation was practised throughout the Chinese empire before the natural contagion had reached the European shores. About the middle of the sixth century (*Mead, De Variolis*, p. 3), it is supposed to have been conveyed by trading vessels from India to Arabia; and there is no question that the triumph of the Arabian or Saracenic arms introduced it from Africa into the Levant, Spain, and Sicily.

The pathognomonic characters of the genuine smallpox are, pus in the eruptions, and a power of propagating itself both by contagion and inoculation. Perhaps, however, there is no exanthem that is so much affected by accidental influences as the smallpox. Idiosyncrasies of various kinds seem to take off all predisposition to the disease, and to render the body inert to its virus; so that many persons possess a natural exemption, and pass through life without ever suffering from it.* There are other

* A striking occurrence, forcibly illustrating this position of the author, took place on board the well-remembered Jersey prison-ship. In this loathsome receptacle, which was specially appropriated for the confinement of American prisoners, more than one hundred and twenty men were imprisoned, who had never been affected with smallpox either naturally or by inoculation, and

changes introduced into the constitution from numerous causes, which, though they do not take off all predisposition to the disease in every individual to whom they are applied, afford an entire exemption in many cases, and exercise so controlling a power in others, that the general character of the disease, whenever it makes its attack, is greatly modified, and, for the most part, greatly mitigated; so that the accompanying fever is considerably less violent, the secreted fluid, instead of being a creamy pus, is a limpid ichor, desiccating in three or four days, and so far imperfect in its elaboration as to be less capable of propagating itself by contagion or inoculation, or of affording an absolute security against a reproduction of the disease in future: whence many persons, from the writings of the Arabians to those of our own day, are said to have suffered from smallpox, not only twice, but even three or four times in succession. In these accounts, mistakes have, perhaps, often been committed as to the species or even genus of the eruption; but, in various instances, the disorder has been so narrowly watched, and the judgment of the physician who has described it been so sound and unimpeachable, as to leave no fair ground for doubt upon the subject.

Of the nature of the constitutional peculiarities that are thus capable of controlling the exanthem, and deflecting it from its ordinary course, we know nothing; and of the causes themselves, which appear to be numerous, we know only a few. The virus of cowpox, introduced into the system, is now satisfactorily ascertained to be one of these causes, and apparently one of the most powerful. In most cases it affords, as we have already seen, an entire exemption; and, where it does not altogether take off the predisposition, it generally succeeds in giving the disease that modified and mitigated character which has been just noticed. The virus from the ulcerated heels of horses labouring under the disorder called grease (*Jenner, Inquiry into the Causes and Effects of the Variolæ Vaccinæ*, 1798), seems also capable, as we shall observe hereafter, of producing a similar control. And, as in most of the more extensive epidemics of smallpox, in every age since its first appearance, we have had numerous examples of such modified and imperfect eruptions, varying in almost every diversity of manner from each other, as well as from the regular pustules, but evidently produced by associating with patients affected with the last, and not unfrequently by inoculation itself from pure pus—examples in which neither of these causes have been present—we are compelled to admit, that there are numerous other causes existing, perhaps other diseases existing as causes, to which the bodies of those who exhibit such modifications, or anomalous and imperfect sorts, have been previously exposed, and are indebted for so modifying a control, of which also, at present, we know nothing.

Rhazes has given numerous examples of these diversities or aberrations of smallpox, or Al-gridi, as he denominates them, though the more common name was Al-jedder الجدري, and hence the remarks of John of Gaddesden, "notandum quòd variolæ sunt duplices, propriæ et impropriæ.—(*Ros. Anglie*, p. 1044.) The IMPROPRIÆ it is often difficult to follow up or arrange, in consequence of their discrepances, and especially their resemblances to other kinds of eruption. More commonly they approximate the form and general character of pemphigus or varicella (chickenpox), and have no doubt often been mistaken for the one or the other, especially the latter, of which the severe variolous epidemics that have of late years, after a long dormancy, spread over Edinburgh (*Account of the Varioloid Epidemic, by John Thomson, M. D.*, 8vo., 1820), Caithness-shire, and various other parts of Scotland, as well as over many parts of the continent, afford striking examples; as has also the late variolous epidemic among the inhabitants of Columbo, and the Kandyan provinces at Ceylon, as related by Mr. Marshall.*

Many of the cases of this kind, described or collected by Dr. Thomson, to whose indefatigable zeal the profession is under an irremunerable obligation, are peculiarly striking; as they consist of families, the different branches of which, receiving it in succession from each other, evinced in turn almost every variety to which the smallpox can make any fair pretension, distinct, confluent, crystallized or varicellous, and horny; and all of which, in many instances, manifested a power of regenerating and propagating the disease in its purest or pustular form, though this was often lost in several of them. The following case, contained in a letter from Mr. John Malloch to Dr. Thomson, is peculiarly entitled to attention. "No case of smallpox had occurred in this town for nine years till last winter, when an idle boy, who was in the habit of wandering about the country, frequenting markets, &c., happened to be at a house where some of the inmates were said to be ill of smallpox. He himself had been vaccinated some years before On his return home he was seized with febrile symptoms, and confined for two or three days to bed, when an eruption similar to chickenpox made its appearance. Immediately the fever abated, and in a few days more he left his bed and attended a cattle-market, half a mile's distance from the town, without experiencing any bad consequences. About a week afterward one of his master's children was taken

yet of that number less than two thirds were attacked with the disease, which, however, proved extremely fatal. One would naturally expect, that in such a place the specific virus of smallpox would act with much more violence. This fact was communicated to Dr. Francis by the late Philip Freneau, of New-Jersey, one of the prisoners.—D.

* Some Account of the Introduction of Vaccination among the Inhabitants of the Interior of Ceylon, and of an Epidemic Smallpox which prevailed in the Kandyan Provinces in 1819. By Henry Marshall, Surgeon to the Forces.

ill, and went through the regular stages of smallpox in a mild manner; then a second similarly. A third suffered in a very alarming degree from the confluent kind; a fourth was rather worse than the two first; and the youngest, of eight months old, had what, if the other cases had not occurred, I would, without hesitation, have called chickenpox: for there was little or no fever, and the pustules were filled with a watery fluid, which was not converted into the purulent appearance of smallpox. None of these children had undergone vaccination."—(*Variol. Epidem.*, p. 333.)

It is very singular that in the Kandyan epidemic described by Mr. Marshall, while several cases made a very near approach to varicella, all of them so far deviated from the ordinary character of the variolous secretion as to be devoid of a creamy and consistent pus, and rarely to exhibit more than a whey-like matter, whether the eruption were distinct or confluent, or the fever mild or severe. In other respects, Mr. Marshall observes, the disease did not materially differ from the description given of the smallpox by systematic writers. For some days the eruption was papular; it then became vesicular, each vessel having a depressed point in the centre. During the early stage of the vesicles they contained pure lymph; subsequently they became less pellucid, and assumed a whitish hue; and, when matured, they contained the above whey-like fluid. "In no instance," says he, "that came under my observation, did the contents of the vesicle assume a yellow colour and thick consistence, as is stated to occur in smallpox in Europe."

These, it should be observed, were not cases that had been preceded by vaccination. Many such occurred, but the eruption was here of a still different and more modified, and even a more mitigated kind, still showing the controlling power of the vaccine fluid. This eruption, indeed, was occasionally severe, but uniformly appeared after two or three days' fever. For the most part, it was confined to the fore or the upper part of the body, ranging from one or two to thirty papulæ, and was remarkably uniform in its progress. It consisted of elevated hard pimples, containing a vesicle of pure lymph *at their apex*. These, by the fourth, fifth, or sixth day, reached their full size, and were soon followed by desquamation.

It not unfrequently happens, that, in dangerous cases, the papulæ do not rise kindly, but assume the form of stigmatized dots, while the surface is circumfused, generally, with a brighter or deeper efflorescence, according to the nature of the habit; under which circumstances the disease makes a near approach to rubeola, and has at times been mistaken for it. Of this form, also, the late Ceylonese epidemic, as described by Mr. Marshall, afforded various instances. "There were a few cases," says he, "where the skin assumed a MEASLY appearance. Under this description of the disease, the surface of the body resembled wet brown or blotting-paper. The fever continued without abatement, and frequently little or no eruption appeared. I am not aware that a single case of this kind recovered."

And where, in the confluent variety, the secreted ichor (for the inflammation is seldom suppurative) is peculiarly virulent, we frequently meet with trails of vesicular and fiery erythema spreading over different parts of the swollen body, not unlike, in appearance, to the ignis sacer of that variety of plague which the ancients peculiarly distinguished by the name of anthrace, and which in the present classification is denominated erythematous plague.—(See Gen. IV., Spe. 1, Var. *y* of the present Order.) And the resemblance is still more close, when this form of confluent smallpox is combined with bubonous or other ulcers: of which examples are frequent in hot climates, as in the epidemic attack of smallpox at Aleppo, described by Dr. Russell. "If the sick," says he, "survived the eleventh day, few of them escaped corrosive ulcers with carious bones, or *hard swellings in the glandular parts*."—(Oct., 1742.) Even in the colder temperature of our own country, the same miserable train of symptoms has sometimes shown itself, as observed by Dr Huxham, "variolæ epidemicæ interdum crudo diffluunt ichore, qui subjectam carnem erodit, imò et nonnunquam ipsâ gangrænâ afficit."—(Julio, 1744.)

It is not very surprising, therefore, that the smallpox, on its first discovery, and, indeed, for long afterward, should, according to the variety it assumed, have been confounded with all these diseases, and especially with the measles and chickenpox—from their originating, or, at least, being first noticed about the same period, and consequently being equally new diseases. Hence we are told by Rhazes, that Aaron of Alexandria, who wrote on this disease as early as A. D. 620, arranged the smallpox, measles, and anthrace, or erythematous plague, as products of one common specific contagion.—(*Rhaz. De Variolis et Morbillis, in Continent.*, lib. xviii., cap. viii., 1486.) The last was, indeed, soon thrown out of the list, but the two former continued to be contemplated by most writers as one and the same disease for eight centuries after the era of Aaron.

With respect to the smallpox and chickenpox, there has been more difficulty. A contest of no ordinary magnitude arose in early times upon the subject, in support of which, every nation in Christendom, as in the Holy Wars, for many ages sent forth its champions, and the conflict has been of a still longer duration than the Holy Wars themselves.

In the midst, therefore, of all this confusion of diseases, nothing can have been more called for than a judicious attempt to distinguish the one from the other, and to lay down their respective landmarks; and hence, those who have engaged in such an undertaking have ever been entitled to the warmest thanks of the profession.

Rhazes, in this respect, may be said to have taken the lead. He carried at once the anthrace, or erythematous plague of Aaron, to a distinct genus from al-gridi, or the smallpox; and though he continued this last and measles

الحصبة, (*al hasbet*, rather than al-hasba, as commonly written), under the same genus, he arranged them as distinct species, and consequently regarded them as separate diseases; while to the smallpox, thus disentangled and simplified, he assigned pretty nearly the same varieties as have been allotted to it by the most discriminating writers of the present day; for he very accurately describes the distinct, the confluent, and the limpid or vesicular, including the crystalline and horny; and treats of the disease under the opposite characters of benign and malignant.—(*Rhaz. De Variol. et Morb.* See also *Mead's Works*, vol. ii., p. 163, edit ed. 1765.)

Unfortunately, the limpid or lymphatic smallpox was incautiously denominated chickenpox, by way of distinction from the purulent, by many writers of great authority and talents, as Morton (*Treatise upon Smallpox*, Lond., 1694), Gideon Harvey (*Treatise on Smallpox and Measles*, Lond., 1696), Mead (*De Variol. et Morb. ex Rhaz.*, Lond., 1766); while, which was more common, varicella or waterpox in all its varieties, was designated by the term variola, though regarded as having no real claim to such a term, and hence discriminated from the genuine disease by the adjunct *spurious* or *bastard* variola, of which Van Swieten furnishes us with a striking example. For after having noticed under his description of variola the *steenpochen* (stonepox), *waterpochen*, and *windpochen* (*Comment.*, Aph. 1381, vol. v., p. 11, edit. Lugd. Bat., 4to.), all of which he distinctly characterizes by the name of spurious variola, and observed that he has seen them as frequently epidemic as the genuine smallpox, occasionally, indeed, running a race with the latter, and sometimes succeeding it, he dismisses them altogether, and proceeds with the history of the genuine disease in all its modifications: telling us that, like Dr. Mead, he had met with the crystalline variety, as well in the confluent as in the discrete form, occasionally, indeed, intermixed with the pustular: and that, under this variety, was reckoned by the best writers the siliquose, or that which consists of soft and empty vesicles, but which are sometimes at last filled with pus.—(*Comment.*, ut suprà; Aph. 1398.) In much of this he is followed by Sauvages, who, however, regards varicella by name as a distinct variety of smallpox; while with Hoffmann (*Opp.*, sect. i., cap. iii., p. 293, ed. Gen. 1740), he separates it from the crystalline or lymphatic variety, which he makes synonymous with horn or cornoidal pox (spitzpochen), and waterpox.—(Cl. III., Ord. II., Gen. II.)

A more pointed discrimination, therefore, became necessary, and a still stricter attention to the specific characters by which smallpox and chickenpox are distinguishable. This was successively undertaken by Fuller (*Exanthematologia*, p. 167, Lond., 1730), Borsiero (Burserius) (*Institut. Med.*, tom. ii.), Hosty (*Mercure de France*, Janv., 1769), Heberden (*Med. Trans.*, i., 427), and Willan; and has been so far accomplished as to have satisfied the profession generally, although it has not, perhaps, at any time, set the question altogether at rest in the mind of every one.

Of late years, however, the learning and acuteness of many pathologists seem to have put us in no small danger of going back into all the confusion which existed in former times; not in any respect from ignorance of the real nature of the eruptive diseases towards which their attention has been turned, but from a scientific desire to generalize and simplify them.

About thirty years since, Professor Frank, of Milan, dissatisfied with the ground of that general composure of mind which seemed to have taken place on the subject, commenced a new agitation, and undertook to show that chickenpox (varicella), crystalline, and hornpox, and in general all those forms of exanthem, which, since his time, have been called, though with no very classical term, *varioloid* diseases, belong to PEMPHIGUS as a genus, under which also he places pompholyx. This genus he divides into two species, p. *amplior*, importing the ordinary form of the disease, and p. *variolodes*: "eamque," says he, alluding to this variety, "aut vesicularem (*variola spuria emphysematica*), aut crystallina (*aquosa*, *varicella* auctorum), aut solidescentem (*variola spuria verrucosa*, acuminata, sicca, dura, ovalis auctorum) appellari vellamus."—(*De Cur. Hom. Morb. Epit.*, tom. iii., p. 264.) It is not necessary to follow up his argument, since, however well supported, it has for some time been sinking into disrepute; though, amid the versatilities of opinion and conjecture which have of late distinguished the medical world, it is not impossible, that, like many far more obsolete doctrines, it may yet revive and have its day again. It is necessary, however, to advert to it as forming one of the first and best supported deviations from the general concurrence of opinion that had for some time been entertained upon the subject.

In the variolous epidemic which prevailed during 1816 at Montpellier, the eruption seems to have presented almost all the diversified forms under which it is ever to be traced, in respect to shape and number of pustules, the nature of their fluid, the length of time which they require in order to be exsiccated into scales or scabs, and in the duration and severity of the eruptive, as well as in the absence or presence of the secondary fever. The chickenpox (whether pemphigus or varicella), as is often the case, appears both to have preceded and to have accompanied the genuine variola; and the two were in many instances so closely intermixed and alternated, as to render it a work of no ordinary difficulty to draw a line of demarcation. "Never, perhaps," says Professor Berard, who, in conjunction with Dr. de Lavit, has given an interesting history of this epidemic (*Essai sur les Anomalies de la Variola et de la Varicella*, Paris, 1818), "did the symptoms of chickenpox so nearly resemble those of the smallpox, nor these diseases more fully assume the characters of each other." The result was, that, although at the commencement of the epidemy they contemplated the two diseases as perfectly distinct,

ut running a common race, they were at length inclined to regard them as identic, for reasons highly plausible, and which they advance with great modesty; and thus again enlisted chickenpox under the banner of variola. And since this time, Professor Thomson, of Edinburgh, from an attentive observation of like coincidences in the late variolous epidemy in Scotland, to which we have already adverted, has not only felt inclined to draw the same conclusion, but has, with great industry and force of argument, endeavoured to establish an identity of species between these two eruptions by a copious reference to their history, and the progress of the contest to which they have given rise, as developed in all the standard authorities, foreign as well as domestic, from the accredited date of their origin to the present day.*

It is not a little singular, and tends in the strongest light to show the discursive powers of human genius when aided by the resources of learning, that, at the very moment of this new attempt to combine diseases which have of late years been regarded as distinct, or as claimed in various forms by another genus, Dr. Willan, who had laboured hard to support and rivet such distinction, was engaged in the more arduous task of establishing the identity of smallpox and plague in that variety of the latter which makes the nearest approach to smallpox, and which we have already referred to under the name of erythematous. His researches, which have been published posthumously by his learned relative Dr. Ashby Smith,† are written with an amenity and antiquarian interest that fully entitle them to a place in every medical library, whatever becomes of the question itself, and have, undoubtedly, brought conviction home to the minds of not a few. So that, if the whole of these elaborate lucubrations could maintain their ground, plague, smallpox, chickenpox, pemphigus, and, perhaps, cowpox, greasepox (*Thomson*, ut suprà, pp. 146, 387; *Willan*, ut suprà, p. 69, note 75), measles, and scarlet fever, would all be resolvable into one common malady, and derivable from one common virus. While, as another learned attempt has been set on foot by a third body of pathologists, of no mean authority or pretensions,‡ to show that plague itself, in this case the primary and original source of them all, does not exist in any shape, nor ever has existed, as a specific disease; and is nothing more than a typhous or malignant fever with an accidental appendage of efflorescences, eruptions, or tumours of various kinds, modified by a host of contingencies (to which, indeed, Dr. Frank is also a party in his first volume, p. 136), the whole system of pyretology seems, in the present day, to have some chance of being concentrated into a marvellously small compass, and, for the benefit of future students, may perhaps be engraven on a silver penny. But, where the landmarks of diseases are thus successively broken down one after another, till no guiding-post is left, how is the young student to make his way over the trackless common before him?

This view of the subject might easily be carried still further: for, after Dr. Willan had persuaded himself that the erythematous plague of the ancients was nothing more than the vesicular and confluent variety of smallpox, he persuaded himself still further, that the distinct and coherent form of this disease is, in many cases, synonymous with their phlyzacia, lichenes, and ecthymata (*Will.*, ut suprà, p. 53); thus melting down a multitude of other eruptive affections into the same crucible. Had he lived longer, indeed, it was his intention to have unfolded in a similar way the history of syphilis, which, like all the preceding complaints, he conceived to be of immemorial origin, and, apparently, to have had a close fellowship with them. —(*Miscellaneous Works*, p. 87; foot-note by Dr. Ashby Smith.)

[The leading arguments of Dr. Thomson are, first, that all the cases he had seen of varicella occurred at the same time, and in direct connexion with smallpox, sometimes appearing to originate in it, sometimes to produce it; secondly, that he had never witnessed chickenpox in those whose disposition to variola had been extinguished by an attack of the varioloid disease; and, thirdly, that chickenpox is very rare among those who have not been vaccinated. To these apparently strong arguments it is answered, that Dr. Thomson disregarded the true characters of chickenpox, as determined by the latest and best authors, and confounded with it the vesicular form of the varioloid disease; that though the diseases sometimes alter their characters so as to resemble one another very much, yet, when the term chickenpox is restricted to the unequivocal and most frequent variety of it, described by Mr. Bryce, then it will be found, first, that by natural infection chickenpox never gives rise to any thing else but chickenpox; secondly, that by inoculation it never causes the varioloid disease or smallpox; thirdly, that when it is traced ramifying throughout a family or a district, it reproduces itself in the same form, and with the same mildness, equally in the inoculated, the vaccinated, and the unprotected; and, fourthly, that it reproduces itself as often in its mild form among the unprotected as among the protected, even when it prevails so much as to be accounted epidemical; whereas, all the facts hitherto collected show that when the true varioloid disease prevails epidemically, its form in the unprotected is very often peculiarly malignant.—(*Edin. Med. Journ.*, April, 1820, and January, 1828.)]

It must be conceded to Professor Thomson, that it is often peculiarly difficult, sometimes perhaps unconquerably so, to distinguish by the

* Historical Sketch of the Opinions entertained by Medical Men respecting the Varieties and Secondary Occurrence of Smallpox, &c., in a Letter to Sir James M'Grigor, &c., 8vo., London, 1822.

† Miscellaneous Works of the late Robert Willan, M. D., &c., comprising an Inquiry into the Antiquity of the Smallpox, Measles, and Scarlet Fever, &c., 8vo., Lond., 1824.

‡ Heberden, Observations on the Increase and Decrease of Different Diseases, particularly the Plague, 8vo., 1821.—Hancock, Researches into the Laws and Phenomena of Pestilence, &c., 8vo., 1821.

superficial appearance the nature of the fever, or even the mark that remains on the skin afterward, chickenpox from smallpox; and especially, which is what he particularly alludes to, that modification of smallpox which is so apt to follow vaccinia or cowpox, where the latter has only given the constitution a check, and not an utter exemption. But these approximations are only to be traced in extreme modes of the two diseases, and where they make a considerable divergence from their right and proper course; for, in a pure or perfect state of smallpox and chickenpox, whether we regard them as distinct diseases, or as mere varieties of one common species, there is no difficulty whatever. And even in their widest departure from such state, and their closest approximation to each other, as well in unity of time as of character, they do not more intimately coincide than in the case of various other diseases, of whose distinction there never can be a question. Thus, in idiopathic epilepsy and intestinal worms, the symptoms are often precisely the same; and the existence of the second, at first only conjecturable, is at last only ascertainable by the action of anthelmintics. But worms may also be accompanied with all the symptoms of a genuine hectic, as may this latter with all those of a quotidian or a tertian ague. So measles have often been confounded with rosalia or scarlet fever, and miliaria with eczema, or heat-eruption; and it is one of the most important parts of nosology to point out the distinctive marks of such analogous diseases, though a part in which it has not always succeeded.

As there are some disorders that render the constitution less disposed to smallpox than others, of which the cowpox furnishes us with an example, there are also some that render it more so. In like manner, we find the measles generally superinduce catarrh, and very frequently prepare the way for hooping-cough; insomuch that all these maladies become synchronous. So the chickenpox not unfrequently lays a foundation for the smallpox, and the smallpox may, perhaps, in persons of a particular habit, lay a foundation for the chickenpox; or even the atmospheric intemperament of either of these diseases, when epidemic, may call the other into play; so that both, as we frequently see, coexist, not only in the same place, but even on the same person. In truth, the same constitution of the atmosphere often favours the growth and spread of various diseases equally; and hence, rubeola, varicella, rosalia, and catarrhs, are not unfrequently coincident.

[Here it deserves notice, however, that Dr. Möhl, who has favoured the world with a valuable publication on the present subject, has never seen chickenpox in families where smallpox prevailed at the same time, or recently before; that he has twice or thrice, indeed, seen in such circumstances an eruption resembling chickenpox, but never a disease corresponding exactly with its characters, as they will be presently laid down. On the other hand, Dr. Lüder alleges that he has seen chickenpox produced by the variolous contagion; but his strongest proof, when carefully examined, amounts to nothing. The eruption was preceded by fever of three days' duration: it assumed at first the papular form, and it seems not to have become vesicular till the third day after it appeared. We shall presently find that this description does not by any means correspond with the description of an unequivocal case of chickenpox.—(*Edin. Med. and Surgical Journ.*, No. xciv., p. 185.)]

The two diseases before us have marks, if I mistake not, so strictly essential as to render it highly incorrect and unscientific to contemplate them as mere modifications of a common exanthem; which, moreover, in various cases, by throwing the practitioner off his guard, might lead to a very erroneous treatment and a dangerous exposure of the person. If these be not to be found in the ordinary distinctions that have been pointed out by Dr. Heberden, Dr. Willan, and other monographists, as resulting from the form and duration of the pock, the consistency of its fluid, and the integrity or dip of the skin after the eruption is over, we must look beyond the obvious symptoms to the intrinsic properties of the respective matters eliminated, and the influence of the two diseases on the constitution in future. And here I think we shall not look in vain.

I. The matter of smallpox is capable of reproducing smallpox BY INOCULATION. It continues true to its own specific character, and possesses this power to infinity. The matter of chickenpox is not capable of reproducing smallpox BY INOCCLATION; nor is it often capable of reproducing even its own kind. It will sometimes excite an irritation around the puncture, but it seldom seems to proceed farther. Nor, indeed, does it always irritate locally: for we have already seen that Dr. Heberden, with all his efforts to obtain this effect, found that "the little wound healed up immediately, and showed no signs of any infection."—(*Med. Trans.*, vol. i., art. xvii.) Of the two cases described by Dr. Willan, the first, indeed, affords an example of regular local specific action; "for the vesicle on the inoculated part went through its ordinary course; and, twelve days after the incision, he observed further, that two small red eruptions appeared on the shoulder, and soon became vesicular;" but, in the second case, even the local irritation appears to have been nearly as trifling and unspecific as in the case of Dr. Heberden; on the third day after inoculation, "the small scratches made by the lancet were discernible, but not inflamed." On the fourth, "they were scarcely visible." On the fifth, "a redness with some degree of hardness and elevation appeared at the places punctured, but subsided again on the following day." On the eighth, "no vestige remained of the inoculation." It should be observed, however, that, *twelve* days after the use of the lancet, two small gnat-bite-like spots appeared on the patient's side, which became vesicular, and that, two days after this, "a considerable number of vesicles, with surrounding redness, appeared on his body; but there were not any on his face." On

the next day "he was free from indisposition, and no further eruption took place." The whole of which general eruption, in consequence of the imperfect action exhibited on the arm, was reasonably ascribed to contagion received antecedently to inoculation; the patient, who was a boy of nine years old, having been the constant playmate of his brother, from whom the fluid was taken, and who had caught the disease at school.—(*On Vaccine Inoc.*, p. 98, 4to., 1806.)

From this slightness of irritability in the fluid of the varicellous vesicle, many practitioners have supposed that it is nothing more than an increased secretion of the serum of the blood, like that which takes place in "any blister produced by scalding or cantharides."—(*Brown's Inq. into the Anti-Var. Power of Vaccination*, p. 223.) This, however, is hardly to be admitted; but it is impossible to reflect upon the readiness with which most cutaneous eruptions, whether merely superficial or constitutional, are capable of propagating themselves by inoculation, as cowpox, plague, syphilis, psoriasis, porrigo, and scabies, in all its forms, as well as smallpox, without a conviction that the fluid of the varicellous vesicle is, at least, one of the most inert of the whole, and consequently something widely different from that of the smallpox.

The power of propagation possessed by genuine smallpox, moreover, is not only, in direct opposition to the power of chickenpox, peculiarly active, but runs through all its varieties, each of which, however deflected from the standard of perfection, has a tendency, though not an equal tendency, to reproduce the same disease, and to model it after such standard: and hence we have a thousand instances of discrete purulent smallpox, generated by inoculation from the confluent or crystalline varieties.—(*Frewen, Essay on Inoculation*, 1749; *Willan, On Vaccine Inoculation*, p. 55.) Not, indeed, that the latter is always as sure in its action, for it often fails from its imperfection; but, wherever it evinces specific power enough to operate, it reproduces the genuine disease, and mostly with a completely matured pustule. In effect, it is rarely that the fluid in the confluent smallpox becomes thoroughly matured or purulent; and yet it is seldom that this has been found unavailing.

II. An incursion of natural smallpox protects the system against the recurrence of small-pox, and an incursion of natural chickenpox against the recurrence of chickenpox; but neither of these affords the slightest security against the other. This protection, indeed, is not universal, and hence we have, in both diseases, a few examples of secondary or even ternary affection; but the rule holds generally, and is not fundamentally disturbed by such anomalies. And hence a full proof that the intrinsic qualities of each virus is distinct, and consequently that the diseases themselves are so.

III. The matter of cowpox, which affords a like protection to the system against smallpox, affords no protection whatever against chickenpox. On the contrary, according to many writers, it seems rather to pave the way for chickenpox;—if all the anomalous eruptions which have been regarded as chickenpox since the introduction of vaccination have been fairly entitled to this appellation, instead of to that of spurious smallpox, as they were formerly called; since such eruptions appear of late years to have been more frequent than ever. But of the real nature of several of these we are, perhaps, to the present moment, in a considerable degree of ignorance.

They may, perhaps, be of later origin than either the smallpox, cowpox, or measles, and they may possibly wear themselves out sooner, and give way to other eruptions, of which at present we know nothing. "For it seems deducible," says a learned and highly venerated friend of the author, "that there is not a secretion or exhalation of the human body which may not be so vitiated as to produce diseases communicable to others by contact or respiration, under various fortuitous circumstances of concentration and stagnation, application and action; so that there may be new maladies awaiting our species, which are still to develop themselves under the endless combination of the incidents of human life through endless ages to come."—(*Select Dissertations, by Sir Gilbert Blane, Bart.*, &c., p. 214, 8vo., Lond., 1823.)

By the facility with which some of these are capable of producing fresh crops of their own nature in inoculation, they seem to be distinct from varicella; and from their forming no protection against the smallpox, they are evidently distinct from the latter, notwithstanding their frequent approximation to it in duration, and the external qualities of the pustule.

These are marks uncontested, I believe, by any party; and they are sufficiently different to establish a clear distinction in the nature of the two eruptions, and consequently to separate the diseases from each other.

[The diagnosis between smallpox and chickenpox is much better understood at present than it was some years ago. Whoever has attended to the account given of varicella by Mr. Bryce and Dr. Abercrombie, will perceive that the majority of previous authors had included under that designation some varieties of eruptive disorders, which it is impossible to distinguish from the common forms of modified smallpox. And, although many, or rather most cases of the kind, may be proved to have been cases of the varioloid disease, it is at least highly probable that some of them have been cases of chickenpox, but in one or other of its irregular forms, to the occurrence of which it is liable, as well as every other exanthematic disorder. In defining the disease, however, the leading place must be assigned to its most frequent and regular form; and it is obviously to this form alone that we must confine all observations on its origin and contagious nature.

A great deal of attention has been paid to this subject by Mr. Bryce, Dr. Abercrombie, and the reviewer of Dr. Thomson's work.—(*Edin. Med. Journ.*, April, 1820.) And the result has been, says the critic, whose words we are now quoting, that in opposition to the opinion of Dr

Thomson regarding the impossibility of distinguishing chickenpox from smallpox, or of imbodying in words the idea currently entertained of a pure case of the former disease, we are now in possession of a minute and faithful delineation, which no one can be at a loss to apply in practice. The proper unmodified chickenpox is distinguished, first, by the eruptive fever being generally slight; whereas that of modified smallpox is generally sharp, and of several days' duration; secondly, by the eruption being vesicular from the beginning, or at least from an early period of the first day, not papular, as the vesicular form of the varioloid disease always is for a day or more; thirdly, by the absence of a tubercular basis when the vesicles are fully formed—the vesicles of the chickenpox being hardly accompanied with any swelling around them; while those of modified smallpox are, in the first instance, elevated on solid tubercular bases; fourthly, by the great thinness and fragility of the cuticle covering the vesicles. In applying these characters, two precautions must be observed: on the one hand, the eruption must be seen as early as the second or third day, because, at a later period, the chickenpox eruption sometimes acquires a tubercular base, and the varioloid loses it; and, on the other hand, the judgment must be directed by the general eruption, not by the appearance of a few vesicles differing from the generality. Besides these characters, the critical writer adverts to some others of importance pointed out by Dr. Möhl* and Dr. Lüder.† According to the latter, the varioloid eruption is formed in the true skin, as is shown by the hard elevated base which remains after the lymph is removed by puncture and pressure. On the other hand, chickenpox is situated in the cellular tissue between the skin and cuticle. This may be perceived, as Mr. Bryce formerly pointed out, by opening a vesicle, and examining its edge after the lymph has run out: no excavation or elevation will be perceived, but a surface level with the surrounding skin.

Dr. Möhl agrees with Mr. Bryce and Dr. Abercrombie, as to the rapidity with which chickenpox assumes its proper vesicular structure. He had never seen it on the first day; but, on the second, he has uniformly found it vesicular. He adds another character, not always present however, namely, itchiness of the eruption. And he has given a minute description of the crusts, which he says are characteristic, being irregular, uneven, opaque, of a pale brownish or yellowish colour, formed of the lymph and collapsed cuticle, and falling off, as Dr. Monro pointed out, not in a single piece, like the crusts of variola, but in small fragments.—(*Edin. Med. and Surgical Journal*, April, 1820, and January, 1828.) Both Dr. Möhl and Dr. Lüder, it appears, have furnished a criterion which Dr. Thomson himself admits would, if established, show the fallaciousness of his views. "I do not think," says Dr. Thomson, speaking of his hypothesis, "it can well be set aside, till it shall be proved that chickenpox occurs generally in persons who have not had smallpox, or cowpock, and prevails epidemically, without cases of smallpox occurring among them." It is no wonder, says the reviewer, that the records of medicine should have supplied no such example, seeing how imperfectly chickenpox was, till of late, distinguished, and still more how seldom, till lately, a district of country could be said to be without smallpox. But the political condition of Prussia and Denmark has enabled both our authors to present Dr. Thomson with examples of the most unequivocal nature. From the year 1809 (says Dr. Möhl) till 1823, there was absolutely no smallpox in this city; while, during that period, chickenpox was observed every year: and on that account, there is not a Copenhagen physician who entertains any doubt of the specific difference between the two diseases. Between November, 1823, and March, 1825, while smallpox raged in Copenhagen, chickenpox still prevailed sporadically, but without our having ever seen them arise from variolous contagion, or produce variola. When again the smallpox ceased, during the fine summer months of 1825, chickenpox nevertheless continued to occur frequently. Next year, when the smallpox epidemic returned, Dr. Möhl had frequent opportunity of seeing chickenpox, but still always under circumstances which more and more convinced him that it originated in a peculiar contagion, quite distinct from smallpox.—(*Edin. Medical Journal*, No. xciv., p. 168; also, *Dr. Lüder's Treatise*, p. 120.)]

That smallpox is not identic with any of the varieties of the lœmus or plague, properly so called, of the Greek writers, is still more easily capable of proof. The variety peculiarly fixed upon by Dr. Willan, is that which was often distinguished by the name of ANTHRACE, the erythematous form of the present classification, in which the body is "covered over with trails of vesicular erythema, producing deep, sanious, and gangrenous ulcerations as it spreads, often to a loss of one or more limbs."

In this last there is, indeed, some resemblance to confluent smallpox, as it sometimes shows itself in cases where the fluid is yellowish, transparent, and immatured. But there is no resemblance whatever to the pustular discrete smallpox; and hence Dr. Willan is under the necessity of supposing that the latter are alluded to by the ancients under some other term, and constituted with them another and widely different disease. "As the *angina maligna*," says he, "was for many ages thought generically different from the scarlatina febris, so was the CONFLUENT VESICULAR SMALLPOX deemed a principal branch of the LOIMOS OR PESTILENTIAL FEVER: while the DISTINCT and COHERENT VARIOLÆ, with yellowish pustules and a moderate fever, were ranked with phlyzacia, ecthymata, lichenes agrii, &c. This may be traced up to Hippo-

* De Varioloidibus et Varicellis, Copenhagen, 1827. Said by the Edinburgh Review to be, perhaps, the best epitome on the subject.

† Versuch einer kritischen Geschichte der bei Vaccinirten beobacht. Menschenblättern, nebst Untersuchun. über die Natur, &c. dieser Krankheit., Altona, 1824.

rates:—he, as well as Galen, speaks of pemphigoid fevers, fevers with phlyctænæ, and the anthraces, as *pestilential* and *malignant:* and of another set of fevers, in which appear critical, inflamed, and suppurative tubercles or pustules."—(*Miscellaneous Works*, ut suprà, p. 59.)

Now the term ΑΟΙΜΟΣ, or PESTIS, was employed among the Greeks and Romans, like our own derivative PESTILENCE, in two very different senses, a strict or particular, and a loose or general. Under the first it always imported, as plague or pestilence does in our own day, one and the same specific disease; under the latter, it was applied to various sorts of disease possessing any high degree of malignity, whether among mankind or among brutes, as the word pestilence is still used among ourselves. But it is immeasurably difficult to adopt the view of this subject taken by Dr. Willan, for the following reasons:—

First, we have no DESCRIPTION whatever of any such disease as smallpox in the writings of any of the Greek or Latin physicians: and all that Dr. Willan or any one else can accomplish upon this point, is to glean a few incidental passages which may be supposed to ALLUDE to it in different places or volumes. Now, if the smallpox existed among the Greeks or early Romans at all, it must have existed as a common and popular disease; and it is impossible to suppose, that, among pathologists so minute in their attention to other diseases, and the descriptions they have given of them, as Hippocrates, Aretæus, Galen, and Celsus, they should not have described smallpox also at large, and assigned some fixed and specific name to this, as well as to apoplexy, cardialgia, catarrh, and opisthotonos, instead of leaving us to seek for it at random under the names of lœmus, anthrace, eulogia, and various other affections.

Secondly, as the smallpox, if it existed among the Greeks at all, must have had a frequent existence, and its varieties of discrete and confluent, mild and malignant, must have been known to every one, it is impossible, that Hippocrates or Galen could have made that separation between such varieties as Dr. Willan is obliged to suppose; and have contemplated them as distinct diseases, of very different origins, and destitute of all generic connexion whatever.

Thirdly, inoculation for the plague was occasionally tried in ancient times, as it is in our day, and especially for that particular variety of the plague which Dr. Willan especially adverts to as making the nearest approach to the smallpox, and always with the same result. Instead of producing a milder disease, as in the latter case, it uniformly proved fatal. The last attempt of this kind appears to have taken place in the reign of the Emperor Commodus, A. D. 189, and is thus described by Dion Cassius, in his narrative of the plague which overran so large a portion of the Roman territory at this era, and which is admitted by Dr. Willan to have been the modification of plague now alluded to:—"Many died in another way, not only at Rome, but over nearly the whole empire, through the practice of miscreants, who, by means of small poisoned needles, communicated, on being paid for it, the horrid infection so extensively, that no computation could be made of the numbers that perished."—(*Hist. Rom.*, lib. lxii.)

Dr. Willan notices this passage of Dion, and very adroitly endeavours to turn it to his own account. "This absurd report," says he, "is very analogous to the calumnies against our early inoculators." The inoculators, however, in every other part of the world, when employed upon smallpox, succeeded, in every instance, in triumphing over such calumnies: they were upheld by the force of truth; they pointed to the favourable result of their practice, a result which it was impossible to deny; and hence there is no nation, in ancient or modern times, barbarous or civilized, Asiatic, African or European, as we shall have to observe hereafter, wherever variolous inoculation was introduced, but became gradually sensible of its benefit, and hailed it as an incalculable blessing. Why was not the same triumph obtained by inoculation for the disease before us in Greece and Rome? Why, but for the reason alleged by the historian—that, instead of an incalculable blessing, it proved an exterminating curse, and thus gave a clear manifestation, that this disease was not the smallpox!

Fourthly, that the anthrace, referred to by Dr. Willan, was not smallpox, but a variety of the proper lœmus or pestis, is clear from its existing in the same quarter of the globe in the present day, and being expressly described as such by pathologists of the highest authority, of whom it may be sufficient to mention Dr. Alexander Russell, whose account of this form of plague, as it appeared before his eyes, we shall advert to in its proper place;* and who was also as accurate an observer of smallpox, which he has in like manner represented as it occurred to him; but who never once dreamed of regarding the two diseases as identic (*On the Diseases at Aleppo*, ch. iv.), or possessing any near connexion.

Dr. Willan, however, relies mainly upon Rhazes, who seems unquestionably to have entertained some ideas upon this subject in unison with himself; for, apparently misinterpreting a few loose passages of Galen in the same way as Dr. Willan has done, and particularly where Galen is treating of phlegmonæ, erysipelata, herpetes, and ionthi (*Tr. de Compos. Med., sec. loc. de Prognos. à Pulsibus*, lib. ii.; and *De Usu Partium*, lib. ix.), he tells us that the smallpox and measles were known to Galen six hundred years before his own era. In answer to which, however, it may be sufficient to quote the following admission on the part of the Greek translator of Rhazes's Treatise on the smallpox and measles (al-gridi and al-hasbet), written in the tenth or beginning of the eleventh century, and dedicated to the reigning emperor, and which he entitles περὶ Λοιμικῆς, "on the PESTILENCE;" for by this name, adopting the vulgar

* Gen. IV., Spe. 1. of the present Class and Order.

meaning of the term, he denominates these diseases:—"It is confessed by all persons conversant with the writings and laborious researches of Galen, that nothing which pertains to medical science, or the cure of diseases, has escaped his penetration. With regard, however, to the pestilence (Λοιμικὴ), he is less explicit than on other subjects: he speaks of it *cursorily*, or *in connexion with analogous complaints*, but *he does not anywhere state distinctly the symptoms or appropriate mode of treatment in it*:—strange, that he who first organized the medical art, and defined what had been left indeterminate, should have but slightly noticed a disease to which every man is born liable."

But the most powerful opponent of Dr. Willan upon the whole of this subject, is Dr. Willan himself: who, only a few years before, gave us his opinion upon it in the following form; and it is not a little singular to observe how directly it is controversive of that we have thus far contemplated, while it does not appear that any new facts, or additional evidence of importance, had sprung up before him to produce such a change of sentiment.

On his referring to this celebrated treatise of Rhazes, "he takes it," says Dr. Willan, "for granted, that the smallpox and measles were known to Galen more than six hundred years before his own time, being misled by some incorrect translation of Galen's works into the Arabian language. The passages which he quotes have certainly not the least relation to the diseases above mentioned (smallpox and measles). Indeed, no description of them, nor the slightest collateral hint, appears in the writings of the Greek physicians, which could lead us to suppose they had any knowledge on the subject. Some modern writers have held a contrary opinion, maintaining that Hippocrates and his successors applied to the measles and smallpox the denominations of exanthemata, ecthymata, eczemata, erysipelata, herpetes, ANTHRACES, &c. Now, some of these terms have been strictly defined, and in a way which admits of no such application: the rest are left indefinite, and always intended to express, generally, eruptions on the skin, yet have they not been appropriated to any particular form of them. A controversy founded on materials so slight and unsatisfactory, was carried on with ardour during a part of the last century, but need not at this time be revived, when it is nearly consigned to oblivion."—(*On Cutaneous Diseases*, p. 251, 4to., Lond., 1808.)

In the midst of all this diversity of opinion there is one point at least clear, and universally admitted: I mean, that the earliest distinct description of the disease which has descended to modern times is that of Rhazes. It is contained in his Almansor, which was composed about the end of the ninth or the beginning of the tenth century; and in this he quotes from an Alexandrian physician, of the name of Aaron, who had written on the same subject as early as the year 622.

Yet it is very singular that neither Rhazes nor Aaron, so far as their writings have reached us, make mention of the contagious property of the disease, chiefly accounting for its production by an ebullition of the blood, which they thought particularly incident to the age between childhood and youth. And it is equally singular that it should be asserted by Aaron, as it was also by Avicenna, that the same person is liable to a return of it a second, or even a third time, *præcipuè cùm sanguis sit acutus*. Has the disease undergone any change since this period, so as to render those who have not had it more susceptible of its influence, and those who have had it less? In the descriptive part of the disease, little is to be added to Rhazes's statement, and, what is more singular, he recommends the cool treatment. Unfortunately, however, the doctrine of concoction and despumation of the humoral pathologists spread afterward so widely, and was so generally supported, as to put to flight this correct and rational view of the subject; and every attempt was made, by warm clothing and the warm bath, to mature the peccant matter, and drive it in as large a quantity as possible to the surface; by which the slightest cases were violently exasperated, and too often rendered fatal.

The more severe the disease, the sooner the pustules show themselves, thus completely reversing the law of scarlet fever; a remark for which we were first indebted to the sagacious eye of Sydenham. And hence, in the confluent variety, the eruption appears on the second or third day, while, in the distinct, we have seldom any traces of it till the fourth, and often not till the fifth day.

If a patient have accidentally become impregnated with the contagion of the measles before inoculation or being exposed to the contagion of the smallpox, the latter, as we have already observed, will, generally speaking, be retarded in its progress, and not make its appearance till the measles have run through their course, upon the common law, that the constitution is only affected with one disease at a time. But to this common law we have already pointed out various exceptions; and as gout and rheumatism sometimes co-exist, the measles and smallpox occasionally co-exist also. In the year 1769, Mr. King, of the Foundling Hospital, Dublin, inoculated forty-three children of the establishment. On the fourth or fifth day afterward, sixteen of them sickened with the measles, and went through the disease regularly; yet the progress of the smallpox was not retarded or altered; for the pustules of the latter disease appeared as those of the former died away; and both complaints were of a mild character: a like coincidence occurred in the ensuing year, and with a like favourable termination.—(*Edin. Med. Comment.*, vol. iii., p. 443.)

In this case, the common law of retardation seems to have been interfered with by some peculiar constitution of the atmosphere; for the effect was general to all who were under the influence of rubeolous contagion. In other cases we have a like interference with the common law of variola, from the idiosyncrasy of individuals, or some temporary but equally occult

power, operating upon the system. There are some persons who seem to possess a natural immunity to its influence, and pass through life without ever being infected, though they may have purposely exposed themselves to the most contaminated atmosphere. There are others, who, though incapable of being affected at one time, lose their emancipation at another. "I know an old nurse," says Dr. Huxham, "and one apothecary, who for many years attended persons, and a great number too, in the smallpox, and yet never had them; nay, many that have industriously endeavoured to catch this infection, by frequenting the chambers of the sick, have done it without effect; and yet some of these persons, some months or years after, have been seized with the smallpox."—(*Treatise on Fever, Smallpox*, &c.)

But not only does the susceptibility of the disease vary in degree at different times and in different persons, but the irritability of the body beneath its influence. Thus, among fifty persons who receive it at the same time, and undergo the same regimen, we may perhaps have as many degrees of violence; some dying beneath its severity, some escaping, though with great peril, and indelibly seamed and scarred, and others evincing little fever, and a very slight eruption. The present author caught it casually in London, when a child about six years old, and passed through it with scarcely any disturbance, and not more than twenty scattered pustules.

In like manner we find, under inoculation, that while some persons throw forth a full crop, and suffer considerably from fever, others have scarcely any febrile symptoms, and no more eruption than the pustule on the puncture; the disease, in this case, exhibiting the same change as occurs in inoculated cowpox, compared with the exanthem as received casually from the cow.

It was at one time doubted, whether this slight appearance afforded protection for the future. There is now no longer any doubt upon this subject. But we may go beyond this, and reasonably conjecture, that those who have passed through the disease with but little inconvenience, are even less exposed to future attacks than persons who have had it in the confluent form, and whose faces are marked with its ravages. For as the degree of violence depends, where there is no error in the treatment, upon the degree of irritability which the constitution manifests under the contagion, and as the irritability and susceptibility march with an equal step, he is most likely to have a renewal of the susceptibility, in process of time, who bears the most evident marks of a greater susceptibility antecedently.

It had indeed been conceived by very distinguished pathologists, that the smallpox can never be had a second time, notwithstanding various assertions in support of this fact; and the argument is thus ingeniously put by Dr. Heberden, who was himself a disbeliever:—"It would be no extravagant assertion to say, that here in England not above one among ten thousand patients is pretended to have had it twice; and whenever it is pretended, it will always be as likely that the persons about the patient were mistaken, and supposed that to be smallpox which was an eruption of a different nature, as that there was such an extraordinary exception to what we are sure is so general a law."—(*Med. Trans.*, vol. i., art. xvii.)

This remark is forcible, but the actual occurrences are in many, perhaps most of the instances appealed to, still more so. For, from the cause I have just pointed out, those who have had a repetition of smallpox have generally, if I mistake not, been able to exhibit proofs of a prior attack in pits or scars on the face or some other part of the body, manifesting the violence with which the disease ran its course, and consequently the strong predisposition of the constitution towards it, and irritability under its influence. "It is remarkable," says Sir Gilbert Blane, "that almost all the well-authenticated cases of second smallpox have been of those persons who, in the first instance, had undergone it in its most severe and dangerous forms."—(*Select Dissertations*, &c., p. 209, 8vo., 1822.) Louis XV. of France afforded a clear exemplification of this in 1774; and another still more striking is given, for the ensuing year, in the Memoirs of the Medical Society (vol. iv., 1775), in which, though the first attack was peculiarly severe, the second was more so, and proved fatal. The medical repositories are rich in cases of this kind, some of them so striking and so well established as to prohibit all doubt whatever: and, in the two or three instances which it has fallen to my lot to witness, I have traced the same character; for pits from the prior attack have been visible, while the genuineness of the existing attack was in one instance substantiated by the test of inoculation. In some instances this strong constitutional predisposition runs through every branch of the family, of which Dr. Barnes of Carlisle has given us a striking example in five individuals, sons or daughters of the same parents, who, having all caught the smallpox naturally in the summer of 1818, from which most of them suffered smartly, caught it again in February, 1822, and had it also smartly, though not quite so severely as on the first attack. In both series of affection, the individuals varied in the degree of fever and range of pustules; but in every instance, whether of the first or second series, the eruption was pustular. This account is given in the seventy-sixth number of the Edinburgh Medical and Surgical Journal (vol. xix., pp. 376–378); and the very next article in the same number affords an instance of a family diathesis of the same kind, in four individuals, sons or daughters of the same parents, who were attacked nearly simultaneously with smallpox after having undergone vaccination, which seems to have passed through its course satisfactorily, at different intervals, varying from six to two years. A fifth child, which had not been vaccinated, received the smallpox at the same time, and passed through it in much the same manner, but rather more mildly than one or two of the other instances. The eruption was in every instance distinct and pustular,

though, in one or two, a few vesicles were interspersed.

That erroneous statements upon the subject of a recurrence of smallpox have been very numerously given to the world, is unquestionable; among which we can find little difficulty in placing that of Borelli, containing the history of a woman who recovered from seven distinct attacks of smallpox, and died on the eighth; the antecedent eruptions having doubtless been those of some other exanthem or cutaneous efflorescence; but cases thus clear and incontrovertible are sufficient to establish an occasional departure from the general law, and teach us to look without a scoff upon the assertion of Rhazes and Avicenna, and the far earlier one of Aaron, that the disease occasionally occurs a second, and, in some instances, where there is a strong predisposition to it, even a third time.

A like deviation from the ordinary path of procedure, impresses us in the history of other exanthems. The same general law prevails very strikingly in measles and scarlet fever; but we have also a law of exception; and the exceptions in one disease seem to hold a steady proportion to those in another. They are most frequent in scarlet fever, fewer in measles, and still fewer in smallpox. In plague, the general immunity lasts but for a few weeks; yet some who have recovered seem to be protected for a much longer time, and several for life. In influenza, it extends through the whole duration of the existing epidemy, but the susceptibility recovers itself against the next visitation. In some remittents, as yellow fever, the patient continues little susceptible for many years, perhaps for the whole of his natural existence: in intermittents, the susceptibility, on the contrary, is very generally increased; for the man who has once suffered from an ague, catches it again more readily than another.

A high degree of fever is not necessary to emancipate the system in any exanthem, and consequently not in smallpox. It is upon this principle that inoculation takes its stand in vaccinia, as well as variola. Febrile commotion, as we have observed already, though necessary to throw the morbid poison to the surface, is only necessary in a small, and sometimes an almost imperceptible degree; and if it be urged beyond this, the morbid poison will be increased in quantity, the ferment will acquire a wider assimilation, and hence the fever and the eruption always maintain a balance. Provided the entire system submits to the influence of the contagion, the emancipation is always as perfect under a small product as under a large; and it is wonderful to observe how completely this influence extends through every part of the system, often indeed without any disturbance whatever, upon a deposite of the minutest particle of variolous contagion under the cuticle; for we are perpetually witnessing cases, or rather *were*, when variolous inoculation was more frequent, in which a full change has been operated on the entire frame, though the only pustule has been that excited at the puncture; and the individual, before liable to the disease, is become liable no longer. And that the blood itself, and therefore every particle of the blood, is equally influenced in such circumstances, and even charged with the nature of the virus, is obvious from the frequent communication of the disease from a pregnant woman to the fœtus; and this too at times where the mother is no sufferer from the disease herself.

A remarkable example of this last fact is given by Dr. Mead in the following words:—"A woman who had formerly had the smallpox, and was near her reckoning, nursed her husband who had caught it. At her full time she was delivered of a dead child, whose body was covered over with pustules; a manifest sign that it died of the smallpox before it was brought into the world."—(*De Variolis*, cap. iv.) Mauriceau has another case or two to the same effect (*Sur la Grossesse, et l'Accouchement des Femmes*, obs. 600, et 576); and others have since occurred.*

In these cases there is no assimilation or multiplication of morbid leaven; and influence is indubitably exercised, and that, too, over the entire current of blood, for it could not otherwise reach the fœtus; yet without any sensible effect on the mother. What is the nature of this influence? Is it by an infinitesimal division of the minute drop of contagion inserted into the skin, or that received by the breath? Whatever be the way, it enables us to be less surprised at the mode by which family taints, as gout, scrofula, and phthisis, are transmitted from generation to generation.

Unborn infants do not always receive the smallpox under the same circumstances, nor in every instance even where the pregnant mother sickens with the disease. Sir George Baker, who was indisposed to credit these singularities, refers to two instances, in which the mothers, having been inoculated, had passed through the eruption favourably, and brought forth infants, both of whom, three years afterward, were also inoculated with good effect.—(*Med. Trans.*, vol. ii., art. xix.) From all which we collect, and we can do no more, that a like variation occurs before birth, as we have just observed occurs afterward; and that different individuals, or even the same individual under particular circumstances, evince a different degree of susceptibility; so that the contagion, though resisted at one time, is readily received at another.

There is another feature in the physiology of smallpox that is peculiarly worthy of notice; and that is the power which all deep-seated organs possess of opposing a lodgment of the pustulous inflammation on their own surfaces,

* During the prevalence of the varioloid in New-York in 1822, a highly interesting case occurred: the patient, a young married lady, had been vaccinated when a child: she was affected with varioloid disease six weeks before her accouchement, and was delivered of a dead child, which was covered with smallpox pustules. Smallpox was communicated by inoculation with virus taken from these pustules.—(See Hosack's Essays, vol. iii., p. 472.)—D.

and driving it altogether externally, where it can do least mischief. Dissections have abundantly shown, that the viscera and cavities of the interior are never affected with the eruption: except such as, like the skin, are exposed to the approach or ingress of air, as the nose, mouth, trachea and its ramifications, and the entrance of the meatus auditorius. As a general rule, pustules are never found in the rectum; but, if there be any prolapse, that part of the rectum which concurs in the exposure will share in the common fate of the external parts.*

To what extent variolous contagion is capable of radiating, as it issues into the atmosphere from a diseased body, has never been satisfactorily determined. In laying down the general rules of febrile miasm I ventured to state, that contagion or miasm, generated in the living body, does not appear to be very volatile in any instance, and soon dissolves in a pure atmosphere. The contagion of smallpox seems fully to be governed by this law. When smallpox was more frequent than at present, medical practitioners, though passing casually from house to house, were rarely, if ever, accused of communicating the disease; and Dr. Haygarth has appealed to an evidence of facts in proof, that the sphere of variolous contagion does not include a diameter of fifteen hundred feet, and probably not a hundredth part of such a diameter.

As the susceptibility of smallpox varies so considerably in different individuals, it is not to be wondered at that the irritability of the system to its influence should vary also, and consequently that there should be some difference in the period of time between the supposed communication of the disease and its appearance by any manifest tokens. Upon the whole, the interval may be calculated to vary from six to twenty-one days in the natural smallpox; and in the inoculated, which anticipates the action a day or two, from four days to eighteen.

The writers on this disease have subdivided it into an endless multiplicity of forms; but the four following varieties are sufficient to include the whole:

α Discreta.	Distinct smallpox.
β Confluens.	Confluent smallpox.
γ Degener.	Crystallized-pox, Hornpox.
δ Inserta.	Inoculated smallpox.

The pathognomonic characters of the first variety, or DISTINCT SMALLPOX, are the following:—Pustules pea-sized; distinct, distended, circular; the intervening spaces red; the fever ceasing when the eruption is complete.

The disease opens its battery with the usual signs of a febrile cold fit, accompanied with vomiting, and some degree of soreness in the throat.* About the fourth, sometimes on the third day, the eruption begins to appear on the face, neck, and breast, in minute flea-bite spots (papulæ), which multiply every night for the ensuing four days, when there is usually a pretty full crop of them over every part of the body, though the face is, in almost all cases, far more covered than any other part; and that, according to Camper, in the proportion of five to one.† The head, face, hands, and wherever else the pimples show themselves, gradually swell, and the eyelids are often so much distended as to close the eyes and produce blindness; the spaces between the pimples are reddish, and continue to grow redder as the pimples become pustules and ripen; the fever is of the caumatic or inflammatory kind, and the suppuration is complete on the eighth day, or thereabouts. On the eleventh, the inflammation and pustules manifestly abate, and the latter, measuring the diameter of a pea, dry away by degrees and scale off, and wholly disappear on the fourteenth or fifteenth day, with the exception of those on the extremities, which, as they come out later, commonly continue a short time longer.‡

Such is the ordinary course: but the symptoms vary greatly in severity according to the degree of fever and extent of the eruption, which, as already observed, hold a pretty accurate balance. Where the pimples are few and scattered, there is but very little indisposition; but where they are very numerous, though still distinct, the soreness, swelling, and febrile heat are very distressing: and, under this form, the progress of the disease has often been divided

* Andral asserts (Anat. Pathol., tom. ii., p. 225), that variolous pustules have never been noticed in the bowels, though enlarged follicles have sometimes been mistaken for them, especially in children, in whom these organs are always considerably developed. In what are called putrid or malignant cases, the disease, according to Andral, is complicated with gastro-enteritis more or less severe, that has, on the one hand, modified the eruption, and, on the other, reacted upon the centres of the nervous system. After death the digestive tube presents changes, which vary in different instances from slight congestion to complete ulceration.—Ed.

* The patient is first of all generally seized with languor, drowsiness, vomiting, and pain of the head and loins. The pain in the loins, the sickness, and a tenderness of the epigastrium, present themselves in a strongly-marked degree among the incipient symptoms of smallpox.—Ed.

† Les Avantages de l'Inoculation, &c., Paris, 1782. The small red spots (papulæ) rise, as Dr. Elliotson describes, into elevated pimples, and these again into hard tubercles (tuberæ). The pimples become pellucid, and, on the fifth day, counting from the first attack of feverishness, headache, &c., they become pustules, with opaque, white, purulent contents, and those which are large are generally depressed in the centre.—See Lect. at Lond. Univ., as published in Med. Gaz., vol. xi., p. 273.—Ed.

‡ According to Dr. Elliotson's description, it is on the eighth day that the face swells, and the eyes begin to be closed from inflammation, if there be much eruption. On the eleventh the pustules are at their height, as full and numerous as they will be; and the swelling of the face, the running of the mouth, and inflammation of the fauces, subside, and then the hands and feet swell; first the hands, and afterward the feet. Dr. Good has omitted to mention, in his general description, what is termed the *secondary fever*, which occurs when the suppuration of the pustules is complete about the tenth or eleventh day.—Ed.

into four stages, an incursive, an eruptive, a maturing, and declining or scabbing (*Frank*, op. cit., tom. iii., p. 159), at each of which it discovers an exacerbation of pyrectic symptoms. And when the patient is an infant, it is at these times, and especially on the incursion of the disease, occasionally attacked with a convulsion fit, or perhaps several in succession.*

The grand principle in the treatment of smallpox, as of all the other exanthems that have passed before us, is to moderate and keep under the fever; and, however the plans that have been most celebrated for their success may have varied in particular points, they have uniformly made this principle their pole-star; and have consisted in different modifications of fresh air, cold water, acid liquors, and purgative medicines: heat, cordials, and other stimulants having been abundantly proved to be the most effectual means of exasperating the disease, and endangering life.

Dr. Mead seems to have been almost indifferent as to the kind of purgative employed, and certainly gave no preference to mercurial preparations. His idea was, that all were equally beneficial that would tend to lower the system: "Indicium," says he, "certè satis manifestum, quamcunque materiæ diminutionem, fomitem igni subtrahendo, huic morbo apprimè convenire." And, in this manner, he accounts for the mildness of the malady after any great evacuation, natural or artificial; after acute diseases, immoderate catamenia, childbirth, and salivation.

Mercury, however, appears to have a specific influence upon the action of variolous matter; perhaps, as in the case of syphilis, upon the quality of the matter itself: for though, when considerably diluted with water, it is still capable of propagating the disease by inoculation, yet Von Wënsel has shown satisfactorily that when triturated with calomel it loses its energy, and in inoculation becomes inert and useless. Mercury has hence been denominated, in Germany, remedium pancreston, and has certainly supported its character as the best corrector of the smallpox we are acquainted with, from a period antecedent to the introduction of inoculation into Europe to the present day. "Physicians who attend hospitals," says Sir George Baker, "have frequently observed the smallpox to be particularly mild in those patients who have happened to receive the infection soon after a mercurial ptyalism; and inoculation is said to have been a much more successful practice in some of our American colonies since the use of calomel has been there introduced into the preparative regimen." When given as a purgative, it is usually mixed with the powder or resin of jalap, and in this manner acts more briskly.

Exposure to fresh and cold air is nearly, if not altogether, of as much service as calomel; and hence the advantages of a cool capacious room. Cold water is usually prescribed in large draughts for the same purpose, and very generally proves highly refreshing. The acids, and especially the diluted mineral acids, have a peculiar influence in diminishing the extent of the eruption; insomuch that some inoculators have been bold enough to prophecy the number of pustules a patient would produce under a given quantity of the acid. Whether any one of the acids has an intrisic power beyond the rest has never been sufficiently put to the test of inquiry; nor is it clearly ascertained in what way they operate towards the present effect. They are an excellent refrigerant in fevers of all kinds; but, in smallpox, there seems to be a something beyond this power, and they probably restrain the process of assimilation.

Lemonade may conveniently form the common drink during the fever; or a solution of cream of tartar in water, which, as tending to keep the bowels gently open, will be preferable. When the fever is considerable, the purgative should be repeated at each of its exacerbating stages; and if convulsion-fits arise, the spasmodic irritation is best removed by laudanum.*

The pathognomonic characters of the CONFLUENT VARIETY are the following: pustules confluent, flaccid, irregularly circumscribed; the intervening spaces pale; with great debility.

In this variety the eruption assumes, at first, the appearance of a general efflorescence, without any distinctive points; innumerable pimples, however, show themselves about the third day, being a day or two sooner than in the discrete variety. They soon coalesce from their thronging number, and become filled, not with pus, but a yellowish serum, for this variety seldom suppurates regularly.† The fever is violent, and exhibits a synochus or typhous type; and, instead of subsiding on the appearance of the eruption, as in the distinct variety, generally increases. The head is oppressed, the eyes inflamed, the brain comatose or delirious. After the eighth day, the detached pellicle, covering a large secretion of this virulent fluid, becomes brown, and not yellow as in the distinct sort. Peculiar to the confluent smallpox are salivation in adults, and a looseness in children; the former always attends, the latter more rarely. The spitting begins as soon as the eruption appears, or within a day or two afterward: the saliva is at first thin, and easily and plentifully

* On this subject the following remark by Dr. Elliotson is no doubt very correct:—"It is said that one fit forebodes a mild disease, whereas several forebode a severe disease; but I should suppose, that if the child had no fit at all, it would forebode something still better. When the eruption is taking place, if the individual be an adult, there is frequently a great tendency to profuse sweating."—Ed.

* The utmost cleanliness; plenty of clean linen; a mild antiphlogistic diet, in the first instance; cold or tepid ablution, if the body be hot; washing the patient and room with the chlorides; bleeding in adults, if the head be much affected, or, at any rate, the application of leeches; and aperient medicines, are the means of relief specified by Professor Elliotson.—(See Lecture delivered at London University, as published in Med. Gaz., vol. xi., p. 279.) When debility comes on, he recommends wine and stimulants.—Ed.

† Frequently petechiæ, vibices, and ecchymoses are seen between the pustules—red, dark-coloured spots of various sizes.—Ed.

discharged; but towards the eleventh day, which is the period of the greatest danger, it becomes viscid, and is discharged with great difficulty: the looseness in children, however, continues beyond this period.*

When the disease terminates favourably, the swelling of the face about this time begins to abate, and that of the extremities commences. But if the constitution be incapable of counteracting the weakness under which it is suffering, or the mass of disease with which it is oppressed, and particularly the exacerbating or secondary fever, as it is called, which takes place at the stage of maturation, the cuticle suddenly becomes flattened, the features sink, the pustules are depressed; the coma increases, fleabite spots are sprinkled over the body, succeeded often by hemorrhages; the pulse flutters, and the patient expires; usually, as already observed, about the eleventh, but sometimes not till the sixteenth day.

In the commencement of this variety, the same reducent plan is to be pursued as already recommended in the preceding variety; and the affusion of cold water may be added to a free use of fresh and even cold air. Bleeding is a doubtful remedy, and its propriety must entirely depend upon the constitution or habit of the individual, and the nature of the prevailing epidemy. In a state of high entonic health, and firm elastic fibre, it may be allowed, and perhaps repeatedly: but we should always bear in mind, first, that the plenitude of the disease does not so much depend upon the strength or weakness of the frame, as upon its susceptibility of the contagion, and irritability beneath its action; and next, that in confluent smallpox the process of maturation does not take place kindly or perfectly, and that the fever, often a synochus, has always a tendency to run into a typhus, particularly when the temperament of the atmosphere predisposes to this type. On this account, it will often be found necessary, and particularly towards the stage of maturation, to support the tone of the system instead of reducing it. Camphire offers us one of the medicines for this purpose; and may be given in solution, or in the form of pills. The latter is generally the most convenient, as it can thus be taken in a larger quantity, and needs not interfere with ammoniacal neutrals, ethereal compounds, the acidulated decoction of cinchona, or the same tonic in a more powerful form. If, indeed, on the accession of the secondary fever, the pulse should suddenly sink, the pustules flatten, and the surface turn pallid or purple, wine must be added to the other remedies, blisters or sinapisms applied to the feet or legs; and, if a diarrhœa should supervene, opium be administered; though, in the earlier stages of the disease, this last symptom should be very cautiously interfered with. Some part of the secondary fever may probably be set down to the acrid of the absorbed virus, now thrown back upon the blood from every part of the surface: and, to disarm this source of exacerbation, it may be convenient to open the pustules as they ripen, and let them discharge their contents externally. And, to save the face as much as possible from those exulcerations of the true skin that terminate in pits and scars, a piece of fine linen or cambric, over which some cetaceous cerate has been spread, should be applied.

Smallpox, then, may well be contemplated as a fearful disease. It is so at all times from the uncertainty of its prognosis, but especially when it assumes a severe character.* And it is so, moreover, not merely on account of its own ravage, but of the tendency it produces to subsequent evils, after its own course has subsided. In many cases, the constitution is incapable of recovering from the general disturbance and debility it has introduced, and hence atrophy, dropsy, and hectic are by no means uncommon results. But it more frequently proves mischievous by stirring up some hereditary taint that might otherwise lie quiet through life; and, in this way, becomes an exciting cause of scrofula, consumption, and gout.

The HORN or CRYSTALLINE-POCK it is only necessary to notice, as forming a somewhat singular departure from the usual course of the disease, though not often accompanied with danger, or distinguished by an overloading eruption. Its pathognomonic characters are set down in the Nosological Synopsis as follows:—pimples imperfectly suppurating, ichorous or horny, and semi-transparent.

From some unknown cause, the variolous fluid is, in this variety, secreted and thrown upon the surface in the form of lymph, and is never exchanged for that of pus. As the finer part of the fluid is absorbed, it loses its pellucidity, and the vesicular pimples appear whitish, and preserve this hue till they dry and peel off. This is particularly the case in persons of a fair and delicate skin; but, where the skin is darker or coarser, they become brown, hard, and horny: and hence it is always in this way that the present variety terminates among negroes. Whenever smallpox occurs a second time, it usually shows a tendency to this modification.

It is not a little singular, that Professor Frank should have separated this form of the disease from smallpox, and made it, together with varicella, as already observed, a modification of pemphigus,—(*De Cur. Hom. Morb. Epit.*, tom. iii., p. 264.) What landmark can the student find when the boundaries of diseases are thus disastrously broken up?

The fourth variety under which smallpox is to be found, is the artificial modification known by the name of INOCULATION: a most important

* Sometimes there is bloody urine, or blood in the motions. Blindness, phthisis, and diarrhœa, ending in ulceration of the intestines, are more frequent consequences of V. confluens than of V. discreta.—ED.

* The late Mr. Alcock drew Dr. Elliotson's attention to the fact, that the mucous membrane of the larynx and trachea is frequently much inflamed in smallpox, and that there is an effusion of a very thick tenacious mucus from it, such as produces a degree of obstruction in those tubes, that may have some considerable share in occasioning the fatal result of the disease in children.—ED.

advantage to mankind before they were acquainted with the equal or nearly equal protection afforded by the virus of cowpox; when, in the language of Professor Frank, "ad illud tandem se reductos viderunt; ut victas huic pesti manus traderent, et sic, quasi dæmoni, quo sibi esset propitior, sacrificarent."—(Op. cit., tom. 101, p. 334.)

Its peculiar characters are thus described in the volume of Nosology;—orange-coloured areola about the puncture; pain in the axilla about the seventh day; disease mostly mild; and the purulent discharge sometimes confined to the punctured parts.

This mode of communicating the disease, like the natural disease itself, appears to have reached Europe from the east, and especially from China; where, according to the statements of the Jesuits, (*Lettres Edifiantes et Curieuses*, &c., passim), it has been practised immemorially by perhaps the simplest and best means of communication that has hitherto been devised, —that of a needle charged with the contagious matter of a pustule, and introduced transversely under the cuticle. From China the discovery appears to have travelled into India, and thence to Asia Minor. It is not easy to conjecture how it arrived among the ancient native tribes of Africa, as we know so little of their arriving there themselves. It shows, however, that the disease itself is of very high antiquity, though it does not seem to have travelled in a very early period of the world into Europe; unless, indeed, we ascribe to it various sources of origin, which is accompanied with the difficulty of our not knowing where to stop the moment we embrace such a doctrine; for if we once indulge in a plural number, there is nothing to prevent our carrying such number on to infinity. That the disease, however, has from an early period existed in Africa, and has also been counteracted by the employment of a rude kind of inoculation, is now clear from the narrative of Mr. Campbell, whose veracity will not lightly be called in question; and who tells us, that he found both the smallpox and the practice of inoculation in use among the Marootzee, or inhabitants of the city of Kurreechane, about a degree and a half to the northward of De la Goa Bay, or 24½° south latitude. Here the rivers, which before ran westward, were found to flow towards the east, evidently proving, that he had reached the loftiest point of this part of the continent. The natives, it seems, have a tradition that they procured the variolous matter, or rather learned the art, from a people to the northeast called Mahalatyela, who ride upon elephants. They make the incision between the eyebrows. The Booshuanas, however, inoculate also for the smallpox.—(*Travels in South Africa*, &c., 2 vols., 8vo., 1822.)

The first employment of inoculation in our own country seems to have been the result of some fortunate observation, made, like that of cowpox inoculation, in the rudest parts of it; for the practice of "buying" the smallpox, which was in fact a communication of the disease by insertion, was prevalent in Wales at a very early period, and appears to have been also occasionally resorted to in the Highlands of Scotland, from an antiquity nearly as remote; of which abundant proofs are to be found in various articles in the Philosophical Transactions.—(See vol. xxxii., years 1722–3, *and especially Dr. Williams's account.*) All such practice, however, and even the knowledge of it, seems to have been confined to the remote quarters in which it accidentally arose, as late as the year 1721, when Lady Mary Montague, who had witnessed its success in Turkey, and had had a son successfully inoculated there, submitted an infant daughter to the same process at this time in London. Yet, so little acquainted with its success were the public, and even the medical profession at this period, and so cautious in giving it credit, that an experiment of its effect was ordered to be made in the same year on six condemned criminals, all of whom were fortunate enough to recover, and who thus redeemed their lives. This gave countenance to further attempts; yet the innovation, like that of inoculation from cowpox, was sharply and pertinaciously opposed, and not more than seven hundred and sixty-four persons, according to Dr. Jurin's calculation, were inoculated all over England from 1722 to 1727.*

Unfortunately, the practice of treating the disease with cordials and a hot regimen at this time prevailed, and was too generally applied to the inoculated as well as to the natural process, by means of which the former was often rendered a severe, and, in many cases, a fatal disease; though it was impossible for the dullest intellect to be altogether insensible to its high comparative advantages. By degrees, however, the refrigerant and reducing plan obtained a triumph, and the triumph of inoculation was a synchronous step. Yet half a century afterward the exploded plan was still persevered in by some practitioners, and it is instructive to mark the comparative mischief that still accompanied it. "I found," says Sir George

* The bold experiment of inoculation for the smallpox was received very differently in North America. About the time this practice was introduced into Great Britain, Dr. Zabdiel Boylston, of Boston, Mass., adopted inoculation at the suggestion of Cotton Mather, who informed him of the Turkish practice. Inoculation was first performed in Great Britain, on Lady Montague's daughter, in April, 1721; and on the 27th of June ensuing, Dr. Boylston inoculated first his own son, then thirteen years old, and afterward his two negro servants, in which he was completely successful. "This had the happy tendency," says Dr. Thacher, "not only to confirm in his own mind the safety and utility of inoculation, but in some degree to quiet the fears of others. In 1721 and the first part of 1722, Dr. Boylston inoculated two hundred and fifty-seven persons, and thirty-nine were inoculated by other persons in Boston and its vicinity; of this number six only died, and several of these were supposed to have taken the infection before inoculation. In the same period, 5759 took the disease in the natural way, of whom 844 died."—See Boylston's account of the practice of Inoculation in America, in Thacher's American Biography.—D.

Baker, writing in 1771, "that in the counties of Essex, Norfolk, and Suffolk, many thousands of people, of all ages and constitutions, and some of them of every apparent disadvantage, had been inoculated with general good success: whereas, at Blandford, in Dorsetshire, out of three hundred and eighty-four persons who were inoculated, thirteen actually died, and many others narrowly escaped with their lives from the confluent smallpox."* This gives us a direct mortality of something more than one in thirty; and it is almost needless to add, that, in the successful districts here alluded to, the cooling plan was prevalent, and at Blandford that of hot beds and a warm regimen.

Even this result, however, with all its fatality, offers a wonderful improvement upon the march of natural smallpox; in which one out of every three or four have been computed to die among adults, and one out of every seven among infants; while, wherever the cooling and reducent plan has co-operated with inoculation, the casualties are not more than one in five or six hundred.

Yet, great as is the intrinsic advantage of inoculation, even upon its lowest scale, there is one evil which has always accompanied it, and which, in a nation so justly proud of its civil liberties as Great Britain, it is almost impossible to provide against; and that is, the wider diffusion of variolous contagion through the atmosphere by the indiscriminate use of inoculation in all places. And hence it has been very forcibly observed in our own day, by those who have written most warmly in favour of vaccination, that smallpox inoculation is upon this ground a greater public evil than good; since the multitude who will not consent to be inoculated, receiving the natural disease more generally than they otherwise would do, the total mortality is greater than before inoculation was had recourse to. I was at first induced to think, that this statement was a little too highly coloured for a particular and present purpose. But, on turning to Baron Dimsdale's tables of calculation drawn up nearly fifty years ago, I find him arriving at the very same conclusion; and we may fairly affirm, that the deaths from smallpox, since the introduction of inoculation, have increased in consequence of the more extensive diffusion of variolous contagion in the proportion of fourteen or fifteen upon every hundred. The bills of mortality indeed give us something more than this.

By what means variolous contagion, received by a puncture, becomes so much milder than when received from the atmosphere, is a problem that has never been satisfactorily solved. Something is unquestionably due to the preparatory process of purgatives and a reducent regimen; but as the same mildness of character does not obtain in the natural disease, where the same preparation has been submitted to antecedently, some other power must be sought for. Under inoculation, and with the usual precautions, the eruption is commonly distinct and widely scattered; yet the most striking character in the inoculated form is, that when the eruption is full, and even confluent, the secondary fever, so alarming in the natural disease, is here for the most part slight, and sometimes altogether absent. This exacerbation is usually ascribed to an absorption of the contagion from the pustules; but the feature before us shows, that there must be a something distinct from absorption, though perhaps acting in union with it. Is the virus from the first less irritant, and less capable of exciting much secondary fever, for the very reason that it was less capable of exciting much primary?

It is on this account that variolous inoculation may be submitted to without danger, by feeble infancy, advanced age, and even cachectic habits in every stage of life; and that the season of the year does not seem to be a matter of great importance. Pregnant women, however, ought never to be exposed to it, nor infants, where there is a choice, till after the irritation of teething.

The operation is perfectly simple: the needle, originally employed in the east, is as good an instrument as any, though the lancet is generally preferred. It is only necessary to deposite a minute drop of the contagion under the cuticle, or at least to make such a wound as may give forth a single drop of blood. It is preferable to take the fluid before the pustule suppurates; as afterward it seems to partake of the nature of common pus as well, and produces a larger circle of inflammation, and on this account, also, it cannot so fully be relied on. The puncture does not so completely disappear as in that with vaccine fluid, but it is often scarcely visible for three or four days. At this period a minute papula may be traced, a little itching is felt, and sometimes there is a slight inflammation. On the sixth day, a pain and weight are felt in the axilla, proving that the lymphatics of the arm have become affected, and that the virus is conveyed into the system. On the seventh or eighth day, the precursive symptoms of transient shiverings, headache, and pain in the back are perceived, and immediately followed by the eruption itself; though mostly, in this mild form of the disease, the only eruption, as in the inoculated vaccinia, is the pustule on the puncture, or a few which directly surround it. Where the disease spends itself in this manner, the local efflorescence commonly spreads over a larger area than otherwise, and the adjoining lymphatics participating in the irritation, the tenderness and sense of weight are increased in the axilla. Where the symptoms are unfavourable, there is a purplish, instead of a rosy inflammation, or a narrow, deep-red circle surrounding the puncture, with a dip or depression in the pustule.*

The treatment is to be the same as that already pointed out for the natural disease; but

* Med. Trans., vol. ii., art. xix. Compare M. Gatti's Nouvelles Reflexions sur la Pratique de l'Inoculation, Paris, 1770.

* Dr. J. D. Fisher, of Boston, has published an excellent work on the smallpox, in which the different stages of this disease, &c., are illustrated by coloured plates.—D.

it should vary with the habit, constitution, or age of the individual. Sufficient attention was not always given to this remark formerly: for the preparatory regimen was a bed of Procrustes, to which every one was alike compelled to adapt himself. Sir George Baker openly complained of this inconsistency in his own day (*Med. Transac.*, vol. ii., p. 282); but notwithstanding his censure, it was very generally continued.*

GENUS IV.

ANTHRACIA.

CARBUNCULAR EXANTHEM.

ERUPTION OF TUMOURS IMPERFECTLY SUPPURATING, WITH INDURATING EDGES, AND, FOR THE MOST PART, A SORDID AND SANIOUS CORE.

THE present genus, denominated ANTHRACIA, from *ἄνθραξ*, "a burning coal," by its definition embraces two diseases of very different specific characters, though closely according in their generic marks. These are,

1. Anthracia Pestis. Plague.
2. ——— Rubula. Yaws.

There have been, however, and still continue to be, great disputes among the nosologists as to the proper station of both these species, many contending that plague ought not to be regarded as an exanthem, and most writers having hitherto contemplated yaws as an impetigo, or some other dysthetic affection. Dr. Cullen has expressed a doubt whether the first should not be removed from the order of exanthems into that of fevers; Vogel has actually introduced it into this last order; Willan has rejected it from the exanthems. Parr arranges it as an exanthem in his article *Nosology*, having previously, like Willan, rejected it from that division in his article *Cutanei Morbi*. In his remarks subjoined to the article *Nosology*, he again acknowledges that "on reflection it appears improper" to introduce it into the list of exanthems; and, in his article *Pestis*, he asserts more roundly that "there is no foundation for arranging plague among the exanthemata, and that it should be reduced to the asthenic remittents." Sauvages, Linnéus, Sagar, and Macbride, have entered it in the order in which we have placed it in the present system.

In a few words, there appears strong and almost incontrovertible reason for thus placing it. The fever, as will presently be shown, is eruptive, and as specifically so as that of any of the exanthems; it is contagious like most of them, and, although frequently occurring oftener than once in a man's life, we have the concurrent testimony of all the writers who have been eye-witnesses of its effects, that it renders every one less susceptible for a certain period afterward, and some for the whole term of their existence.

With respect to yaws, the diversity of opinion has been quite as considerable as that respecting plague. Generally speaking, it has been placed in the loose and indeterminate class which has been distinguished by the name of cachexies; Sauvages and Sagar arrange it in the order tubera of this class; Cullen in that of impetigines. These writers take little or no notice of any kind of febrile features that accompany it, whether specific or sympathetic. Dr. Young pays as little attention to the febrile symptoms by which it is said to be distinguished, and, at the same time, transfers it from the division of cachexies (*cacochymiæ*, as he denominates them) to the order of paramorphiæ or structural diseases. Dr. Winterbottom and Dr. Dance, on the contrary, contend that a slight fever is its primary symptom; and Dr. Ludford, to whom we are indebted for, perhaps, the best history which has yet been given of this disease, describes it as a proper eruptive fever, totally unconnected with diet, lues, or any other taint in the blood; commencing with alternations of shivering and heat, lassitude, want of appetite, and pains in the head and loins to so great a degree as to prevent sleep; the fever and every inconvenience diminishing after the eruption, and the appetite returning. So that, like smallpox, it appears to have a regular accession, height, and decline, and, as already observed, may be propagated by inoculation, and is never known to occur a second time. Hence Parr, who seems to have long wavered in his opinion concerning the real nature of this disease, regarding it at one time as a *pustulous exanthem*, and afterward as a mere *cuticular intumescence*, returned at last with a decided mind to his first opinion, and again asserts that "the detail of symptoms shows that the disease is truly exanthematous."

This view of the subject will therefore abundantly justify the present arrangement of both these diseases, support their pretensions to the character of carbuncular exanthems, and consequently develop the nature of the connexion of yaws with plague, under a nosological method founded on the principle of symptoms. In their individual or specific characters, they are, indeed, highly discrepant; but this is not sufficient to call for a separation, while they agree in the common outline that may form the basis of a generic division. The tall and stately acacia of Egypt, and the delicate sensitive plant of our

* As, in smallpox, the inflammation frequently extends to the eyes, opacity of the cornea, staphyloma, and blindness may be the consequences, especially when a pustule has formed on the eye itself. The smallpox frequently leaves the constitution in a state in which scrofula is disposed to arise; the glands of the neck or mesentery enlarge, or phthisis comes on. Frequently, says Dr. Elliotson, it leaves after it rupia and ecthyma, diarrhœa, and chronic inflammation of the mucous membrane of the intestines.

For the prevention of *pitting*, various plans have been suggested. In the hospital at New-Orleans, in 1830, Dr. Picton kept the smallpox patients excluded from the light, and not one of them exhibited a pit or mark on the body.—(See Am. Journ. of Med. Sc., vol. x., p. 119.) Pricking the pustules with a fine needle has been favourably spoken of. Mr. George, of Kensington, has published some observations in favour of covering the pustules of confluent smallpox, situated on the face, with calamine.—See Med. Gaz., vols. x. and xi.—ED.

own green-houses, belong to the same genus in botany, however inaccordant they may appear to the eye of an ordinary spectator.

SPECIES I.

ANTHRACIA PESTIS.

PLAGUE.

TUMOURS BUBONOUS, CARBUNCULAR, OR BOTH; APPEARING AT AN UNCERTAIN TIME OF THE DISEASE: EYES WITH A MUDDY GLISTENING; FEVER A MALIGNANT TYPHUS, WITH EXTREME INTERNAL HEAT AND DEBILITY; CONTAGIOUS.*

It is happy for us that, in describing this dreadful scourge, we are under the necessity of referring to foreign countries, or to remote periods in the history of our own, before the great advantage of public cleanliness and ventilation in our streets was sufficiently attended to, or even known. The earliest visitation of the plague that occurs in English history was in the year 430; the last time it appeared as an epidemic was in 1665, and the last notice of it in the bills of mortality was in 1679. In Edinburgh it has not prevailed subsequently to 1645, long since which period it has repeatedly ravaged all the continent of Europe, east, west, north, and south.†

From the diversified and clashing accounts that are given of this disease by different writers and eyewitnesses in different ages, or different parts of the world, we are justified in laying down the three following varieties, which, while they offer the chief points of discrepance, will be found in their explanation to reconcile the seeming discordances of established authorities.

α	Fructifera. Common plague.	The disease extending to about the fourteenth day; and relieved by the appearance of the eruption.
β	Infructifera. Uneruptive plague.	The eruption imperfect or suppressed; transferred to some internal organ; or superseded externally by stigmata and vibices.
γ	Erythematica. Erythematous plague.	The body covered over with trails of vesicular erythema, producing deep, sanious, and gangrenous ulcerations as it spreads, often to the loss of one or more limbs.

The whole of these varieties have sometimes been exhibited in the same epidemic; the last, however, is the least frequent, whether alone or in conjunction with the rest. All of them appear to have been present and intermixed in the Aleppo plague of 1660–1–2, so clearly and strikingly described by Dr. Patrick Russell, physician at the time to the British factory established at that city; for he speaks of the pestilential eruptions appearing under the form of buboes, carbuncles, or OTHER exanthemata; among which last he takes particular notice of an erysipelatous redness, forming streaks of a reddish purple or livid colour, intermixed with vibices and wheals, or large blue and purple spots, the maculæ magnæ of authors; while, in some cases, he observes that an extraordinary concurrence of these eruptions took place, which, however, was chiefly remarked among children under ten years of age.

In the Barbary plague of 1799 and 1800, so fully and excellently described by Mr. Jackson (*Account of the Empire of Morocco*, &c., 4to., 1809), who was an eyewitness to its effects,—the first and second of the two varieties here offered, the fructiferous and infructiferous, were intermixed, while the erythematic seems to have been absent. It was probably absent also in the plague of Moscow of the year 1771, as it is not noticed by Dr. Mertens, who gives a full description of both the other modifications. In the London plague of 1665, all of them seem to have occurred occasionally; the first and the second, however, most frequently, examples of which are to be found in Hodges, Sydenham, Sir Gideon Harvey (*City Remembrancer*, passim), and indeed all the writers; while, in allusion to the last, Sydenham compares the inflammation of the plague, as it often appeared, to that of an ignis sacer, by which he means an erysipelas; in which nature, he tells us, expels the matter of the disease from the blood to slightly elevated tumours dispersed over the surface in broad red patches: only that this *ignis*, says he, is more violent than the ignis sacer (*Febris Pestilens, et Pestis Opp.*, sec. ii., class ii.):—"*ignis noster isto sacro longè divinior est.*" They seem also to have co-existed in the Neapolitan plague, or rather that of Noya, in 1815, for the police regulations,* as well as the med-

* "The difficulty of presenting a definition applicable to all cases may be conceived from the fact, that the disease varies greatly in its appearance in different instances; insomuch, that even fever is by no means invariably present; and, in rapid cases, death terminates their course before a sufficient time has elapsed to admit of the formation of buboes and carbuncles."—(Bateman, in Rees's Cyclop., art. PLAGUE.) The following is Dr. Joseph Brown's definition:—"An exanthematous disease, consisting of buboes, carbuncles, and pustules, white, livid, or black, distributed in various parts of the body, and generally attended with malignant and very fatal fever."—Cyclop. of Pract. Med.

† Marseilles, which had previously suffered twenty severe visitations in the course of seventeen centuries, was ravaged by it again in 1720. Moscow suffered cruelly from it in 1771 and 1772; and it prevailed at Noja, in the Neapolitan territories, as late as 1815 and 1816. It appeared in the Lazaretto of Venice in 1818; and at Gressemberg, in Silesia, in 1819. In the year 1813 it raged at Malta. With these exceptions, it has of late generally been confined to the northern parts of Africa, the reputed land of its origin, and to those portions of Asia and Europe which are, or have been, under the dominion of Turkey.—See the art. PLAGUE, by Dr. Brown, in Cyclop. of Pract. Med.—ED.

* Giornale di tutti Atti, Discussioni, e Determinazione della Sopra-intendenza Generale e Su-

ical descriptions, have a reference to each of these in very distinct terms.*

In the plague of Athens, on the contrary, as described by Thucydides and Lucretius, we are not sure of the existence of buboes, as not being distinctly noticed, though probably included in the inflammations that are stated to have fallen upon the privities (*τὰ αἰδοῖα*), while the last two varieties were perpetually intermixed; the chief eruption, however, being that of the vesicular erythema, the sacer ignis, or holy fire, as observed by Sydenham. In consequence of which, Thucydides tells us, that "the surface of the body was neither violently hot nor wan; but reddish, livid, and covered over with an efflorescence of minute vesicles and ulcers,"—*φλυκταίναις μικραῖς καὶ ἕλκεσιν*:—but that the interior parts were so burning that the sick could not endure the lightest covering or clothes, and eagerly threw themselves into cold water. And he adds, that the disease, in its ulcerative progress, commencing in the head or the upper parts of the body, migrated over the entire frame, and often fixed itself permanently on the sexual organs, the hands, or the feet (*Hist.*, lib. ii., 50): the whole of which course is by Lucretius described under the express name of *sacer ignis*, or *holy fire*.—(*De Rer. Nat.*, vi., 1164.)†

"Et simul, ulceribus quasi inustis, omne rubere
Corpus, ut est, per membra SACER quom diditur IGNIS."

One of the severest attacks of plague with which Rome was ever afflicted, was that which made its appearance about the middle of the second century of the Christian era, and is supposed to have been introduced into Italy by the army of Lucius Varus, on its return from Parthia. It is loosely but frequently glanced at by Galen, who adverts on different occasions to various cases in which he was consulted. It was a direct counterpart of the Athenian plague, and hence we meet with all the characteristic symptoms just enumerated. "The body," he tells us, "was stigmatized with ulcerating eruptions (*Meth. Med.*, lib. ii., cap. xii.), (*ἐξανθήσεσιν ἕλκεσιν*), which were often livid, and ramified in every direction; while there was no increase of heat to the touch, even when the patient felt as if burnt up with an internal fire. The discharge from the bowels was, at the beginning, and during the augmentation of the disorder, yellow or reddish, but afterward black, like dregs of blood.—(*De Præsag. ex Pulsû*, cap. iv.) The pulse was in many instances not much affected, but there was great thirst, and an urgent desire for cold water." And he adds, shortly afterward, a symptom distinctly noticed by Thucydides and Lucretius, "that from the peculiar stupor of the head, the patient, for a long time afterward, knew neither himself nor his friends around him."—(*De Præsag. ex Pulsû*, cap. v.)

Eusebius has given us a similar account of the tremendous plague which raged over Syria, A. D. 302, in which, however, he more expressly notices, that the SACER IGNIS was intermixed with the CARBUNCLES, and made a dreadful havoc on the bodies even of the few who lived through the disease; very generally fixing upon their eyes, and rendering them totally blind.—(*Hist. Eccles.*, lib. vii., cap. xvii.; ix., cap. viii.) In the correct rendering of his interpreter Ruffinus, "Aeris quoque temperies in tantam corruptionem versa est, ut humana corpora ulceribus pessimis, quæ IGNIS SACER appellantur, necnon et his qui dicuntur CARBUNCULI, replerentur, ita ut ora hominum atque oculos occuparent, et ut siquis forte ex his effugisset mortem, luminibus orbaretur."

In the still more severe and extensive plague which prevailed in the reign of Justinian, A. D. 540, and which ravaged the greater part of Europe and Asia for at least half a century, all the varieties enumerated in the present classification appear to have either co-existed or alternated. It commenced, however, according to Agathias, "in its old form," or with buboes as a prominent and early symptom; which chiefly appeared, as Procopius tells us, in the groins, the armpits, or behind the ears, and were attended with violent fever and stupor, or phrenitis. "The carbuncle," he adds, "did not always show itself, but, on opening a patient's body after his decease, it was detected in an incipient state." Yet, from the diversity of character the disease at length assumed in different individuals, and after it had spread to an illimitable extent, we are informed by Evagrius, that though it still continued to be regarded as one and the same malady, it seemed to consist of numerous disorders. In some, like the Athenian plague, as already copied from Thucydides, it commenced in the head, inflamed the eyes, and tumefied the face, then descended into the throat, and destroyed them. In others, there was a violent flux; and in others again, buboes arose, accompanied with a most malignant fever. Not unfrequently, the patient died on the second or third day, with little mental or corporeal suffer-

premo Magistrato del Regno di Napoli, &c. Napoli, 1816.

* Ragguaglio Istorico della Peste sviluppata in Noya nell' anno 1815. Napoli, 1816.

† The descriptions given by Thucydides and Lucretius, being very imperfect in a medical point of view, certainly will not justify a positive inference that the fatal disorder at Athens was the plague. Dr. Bateman believed that the account, as far as it goes, even proves that the epidemic was not the true plague, since glandular swellings are not enumerated among the symptoms. The description of the state of the skin, indeed, seemed to him, as well as Dr. Willan, to convey the suspicion of smallpox: for it is said to have been reddish or livid, with an eruption of small pustules, or sores.—(Thucyd., lib. ii., sect. xlix.) Some of the plagues mentioned by Livy do not appear to have been accompanied by the glandular tumours and carbuncles of the true plague.—(Rees's Cyclop., art. PLAGUE.) Now although a few examples of true plague are not attended with buboes and carbuncles, the editor believes, that, in modern times, if any fatal epidemic or contagious disease were to originate, generally or invariably unattended with those symptoms, it would not be regarded by any medical men of the present day as the true plague. Hildebrand adopts the opinion of Haller, that the Athenian plague of Thucydides was only a malignant typhus.—Uber d. Ansteck. Typhus, p. 22.—ED

ing. Some became comatose, and suddenly perished in this state; while an efflorescence of the ignis sacer destroyed multitudes.

Dr. Willan, in his posthumous volume published by Dr. Ashby Smith, has taken great pains to show that the last or erythematous variety, which, by the Greek physicians, was often distinguished by the specific name of ANTHRAX or ANTHRACES, was the confluent and ulcerative smallpox of the present day, which he conceives was as well known to the Greeks as to ourselves. It is not necessary to go over this question again, as the author has already examined it at large in the section on VARIOLA; where he has endeavoured to prove, that we have no real ground for believing that either the Greek or Latin physicians were acquainted with this last disease under any form. It is sufficient for the present purpose to remark, that, even in what may be called our own times, both these diseases, the smallpox and erythematous plague, have made their appearance at different dates in the same countries, and under the eye of the same physicians—men whose skill and judgment have received the homage of universal assent—who have never dreamed of confounding or amalgamating them, but have distinctly described the one as a variety of proper plague, and the other as the smallpox, in the ordinary sense of the term; each produced by its own specific contagion, and keeping true to its own symptoms and progress. Such are both the Russells, Forestus (Lib. vi., obs. xi., xii., Schol.), Diemerbroeck, Geofroy of Provence (*Traité de la Peste*, pp. 1, 436), Gotwald of Dantzic, Hodges, and, as already observed, Sydenham. The trailing vesications, which constitute the erythematous variety, are called PAPULÆ ARDENTES by Gotwald, in describing the Dantzic plague, which term Dr. Goodwin has correctly translated FIRE-BLADDERS. In their origin, however, they were often as minute as a millet-seed, and when large were, in Holland, denominated GRANUM PIPERIS.

When they were of larger magnitude, there was sometimes a difficulty in distinguishing them from proper carbuncles; whence, by many writers, the two are confounded or described under a common name. Hodges very properly made a distinction between them, but Forestus and Gotwald arrange them as only modifications of one and the same eruption, and Dr. Patrick Russell seems partly inclined to contemplate them in a similar light, though he speaks doubtfully. "The same eruption," says he, "appears under various forms, as it happens to be viewed in its different stages; and hence, perhaps, the varieties of the carbuncle have sometimes been erroneously multiplied. I will not be confident of not having fallen into the like mistake."—(*Treatise of the Plague*, book i., chap. iv., p. 121.)

Gotwald makes not less than four varieties of the carbuncle, as he traced it in the plague at Dantzic in 1709. It is the last of these that constitutes the erythematous form before us. "It is," says he, "the most curious, as Purman, in his Treatise of the Plague, has well observed. Sitorius calls them pale, livid, ulcerous papulæ: they appear with a high, yellow blister, which seems full of corruption: the circle round it is first red, then of an ash colour; the blister soon falls, and with the carbuncle, appears scarce so big as a pepper-corn, *continually eating deeper and wider.*"—(*Hist. Account of the Plague, &c.*, p. 49, *by N. Goodwin, M. D.*, London, 1743.)

To the same effect Forestus:—"Carbunculus ferè autem oritur ex pustula exili, milii seminis magnitudine: interdum vero multi prosiliunt, primò quidem pruritû, deinde rubore, ardore, doloreque vehementi. Hoc verò sensim increscente, pars uritur, crustosumque ulcus *quasi candenti ferro* inducitur, idque vel nigrum, vel cinereum."—(Lib. vi., obs. xi., Schol.) To which he adds, in another place, "et in ore eorum cernes aliquid pestilentis coloris cum partim *erysipelatosum*, partim colorem habent *depascentibus serpentibus similem per plures partes diffusum.*"—(*Forestus*, obs. xii., Schol.) And in proof that the same variety of eruption did occur also in the plague of London, to the testimony already offered of Sydenham, it will be sufficient to add the following of Hodges. "There were occasionally," says he, "vesications, of size from a pea to a nutmeg, encompassed with a variegated circle, generally reddish. They arose with exquisite and shooting pain, and *contained an ichor of a yellowish or straw* colour, which was *so acrid or caustic, that it soon corroded the vesicle* and burst out, of a colour yellowish, livid, or black. These pustules broke out in many parts of the body; their station and number being uncertain: sometimes few, sometimes many: in one case, *the whole body was covered all over with them.*"—(*Loemolog.*, p. 110.)

It is impossible that these writers could be mistaken in the nature of the complaint, and have regarded that as plague which was really smallpox: and as they describe, in these passages, the very lineaments of the Athenian plague and other erythematous forms of it among ancient nations, there is no reason whatever for conceiving the physicians of Greece and Rome to have been more deceived than those of recent times.

The greater part of these passages precisely correspond with the character of the *erysipelas pestilens* of Lorrain, delineated under this name by Sauvages, who has copied freely both from Sydenham and Hoffmann; but which, though he calls it an erysipelas, had, as he admits, the closest affinity with plague in its most malignant form,—"cum atrocissimo morbo pestilenti summam affinitatem habet;" and was in reality this disease in the form before us. "Each," says he, "commences with horror, burning heat, delirium, prostration of strength, vehement pain of the back and head; in each, the burning matter of the disease breaks forth, on the fourth day, on the axillary or inguinal glands, and spreads to the feet in the form of the ignis sacer; in the glands it produces abscesses; in the extremities gangrene." It is the mal des ardens of the French writers; and, in its malignant variety, the *erysipelas gangrænosum* of Willan. Much of this difference,

however, seems to be dependant upon local or accidental circumstances, and especially upon the state or constitution of the atmosphere. Thus we are told by Sir James M'Grigor, that when the plague first broke out in the Indian army in the course of its laborious expedition to Egypt, the cases sent from the crowded hospitals of the 61st and 88th regiments were, from the commencement, attended with typhous symptoms; while those from the Bengal volunteer battalion, and the other corps encamped near the marshes of El-Hamed, evinced uniformly an intermittent or remittent type; and those that occurred in the cold and rainy months of December and January, an inflammatory character; after which, as the weather became warmer, the disease at Cairo, Ghiza, Boulac, and the isthmus of Suez, wore the form of a mild continued fever.—(*Med. Sk. of the Expedition*, &c.)

The plague of London in 1665, was, in like manner, distinguished by a peculiar constitution of the atmosphere, which excited an epidemic synochus of great violence and danger, often accompanied with symptoms of rheumatism or pleurisy, and which seems to have added considerably to the progress and mortality of the plague. Sydenham expressly calls it a pestilential fever, *febris pestilentialis*; and adds, that the fever of the plague, after it had broken out, so completely assimilated itself to its character, that, in the second or infructiferous variety, it was extremely difficult to distinguish between the one and the other.—(Sect. ii., cap. i.)

In like manner Thucydides expressly tells us, that whatever incidental complaint any person was labouring under during the plague at Athens, it was sure to run into this disease, which swallowed up every other. Yet he adds, that at the commencement of the plague, complaints of all kinds were peculiarly uncommon; insomuch that, by the acknowledgment of every one, the year seemed to have enjoyed a general immunity.—(*Hist.*, lib. ii., 49.)

The plague at London first attracted attention about midsummer, and augmented in its destructive ravage till the autumnal equinox, at which time about eight thousand died within the bills of mortality in the space of a week, though two thirds of the inhabitants, at least, had fled into the country to avoid the infection. From this time, it suddenly put on a milder character, and made fewer attacks; nearly ceased, as is uniformly the case, with the cold of the winter; and totally vanished by the spring; the epidemic fever, nevertheless, remained for a twelvemonth longer, though this also was both less common and less virulent.

As Sir Gilbert Blane observes, it is incontestably established by the experience of ages, that the disease of the plague cannot co-exist with a heat of atmosphere above 80°, nor a little below 60°.—(*Select Dissertations*, &c., p. 314, 8vo., 1822.) It never fails to disappear in Egypt at the summer solstice, the heat being then pretty uniformly at 80° or upwards. Its chief prevalence, therefore, is in Lower Egypt. It is almost unknown in Upper Egypt; totally so in Abyssinia, in Mecca, and the southern parts of Arabia.* On the contrary, it appears, from the history of all the plagues of which there is any account in England, that they have never begun to appear epidemically but in the end of June, or about the beginning of July: that they proceed increasing till September, when they are at their acme, and then decline until they entirely subside in winter, with the exception of a few sporadic cases.—(*Select Dissertat.*; also, *Russell on the Plague*; and *Bancroft on Yellow Fever*, p. 579.) The influence of temperature is, indeed, striking in numerous diseases, and even in many of those that issue from a specific contagion, of which we have already given an impressive example in its effects on syphilis in the West Indies.

[Dr. Bancroft has brought forward various observations, made by himself, in proof of the influence of atmospheric heat and cold, in both their extremes, in rendering the contagion dormant, or in suspending that susceptibility or affinity of the human body, without which it cannot produce disease in ordinary circumstances. Pestilential contagion, he observes, probably exists at all times in Lower Egypt, Syria, and many of the great cities of the Levant, and it is frequent on board Turkish and Greek vessels. When he was in Egypt he remarked, that the obvious effect of heat in lessening the susceptibilities of individuals, or their aptitudes for taking the disease, was most evident in those who had lately arrived from cold climates, and who were comparatively most affected by the summer's heat. "There were, however, persons in Egypt," he adds, "who had been long accustomed to greater degrees of heat, and who were therefore not rendered insusceptible of the disease; and some few of these caught it after it had become extinct in the British army, and when a person landed from England would not receive it, though he slept in an infected bed; and it was from this cause that, in the autumn of the same year, the disease began at Rosetta nearly two months before the usual time, i. e. on the 13th of September, when I first discovered it in two natives of the East Indies, attached to the Indian army; and it was propagated with some rapidity for six or eight weeks, among persons who were either born in or had just come from a climate *much hotter* than Egypt."—(*Bancroft on Yellow Fever*, p. 591.)]

The same controlling circumstances take place all over the world; and, in studying the history and progress of the disease, we must allow for the changes they effect. Dr. Mertens has well described this progress in the plague

* The plague, therefore, may be said to be endemic in Egypt, where it arises every autumn, and prevails till the beginning of June in the ensuing year. By some the vernal equinox is said to be the period of its greatest fatality; by Sir John Webb, however, the month of November. In the spring, the southerly winds, which pass over the deserts and the lakes left by the waters of the Nile, blow three or four hours a day for several weeks. In June the country is refreshed and rendered healthy by cool breezes from the north.—See Larrey, Mém. de Chir. Mil., tom. i.—Ed.

of Moscow of 1771, at which time he presided over one of the largest hospitals of the imperial capital, and was an eyewitness to its ravages. —(*Obs. Med. de Febr. putr. de Peste, nonnullisque aliis morbis*, Vindobon., 1778.) Having noticed its liability to modifications from several of the above causes, he tells us, that, in general, it begins with headache, giddiness, horripilation, prostration of strength, fever, nausea, vomiting, redness of the eyes, a dejected countenance, and a white foul tongue. A tickling, attended with slight pains, is perceived in the parts where the buboes and carbuncles afterward break out. "The former," says he, "are glandular swellings, not acutely painful, and more or less elevated; usually seated in the groins or armpits, but occasionally occurring in the neck, cheeks, and other organs of the body." The latter he describes very nearly in the words already employed in the specific definition of the carbuncle or anthrax in the preceding pages of this work, though he observes that "in the plague, this tumour evinces somewhat less prominence, pain, and inflammation, than when it arises as an idiopathic affection."

"Many," he tells us, "died on the first or second day of the attack, before either of these kinds of tumours made their appearance." In such cases, an eruption of petechiæ, maculæ, or vibices, like what occur in putrid fevers, usually took place a few hours before death; but sometimes the disease was so sudden as to outstrip the march of these active precursors of dissolution. Almost all who died were cut off on or before the sixth day, insomuch that those who reached the seventh were pronounced to be out of danger.

The disease was introduced into Moscow by a communication with the Turkish army; it made little progress during the earlier part of the year, but became fearfully fatal with the advance of summer, and gradually died away with the frost. The mortality was tremendous. Seventy thousand inhabitants were cut off in a few months, twenty-two thousand in a single month, and sometimes twelve hundred in twenty-four hours. Notwithstanding which, by cautiously blocking up every avenue except one to the large hospital over which he was appointed physician, and keeping a strict and constant guard at the entrance thus left open, although the building was in the midst of the city, it was maintained perfectly free from infection, while the disease raged around it in every quarter.

Mr. Jackson's account of the plague at Morocco is in perfect consonance with this description, though it contains a feature or two in addition, which probably became more prominent from the higher temperature of the atmosphere. "The symptoms of this plague," says he, "varied in different patients; the variety of age and constitution gave it a like variety of appearance and character. In some, it manifested itself by a sudden and violent shivering; in others, by a sudden delirium, succeeded by great and unquenchable thirst. Cold water was eagerly resorted to by the unwary and imprudent, and proved fatal to those who indulged in its momentary relief. Some had one, two, or more buboes, which formed, and became often as large as a walnut in the course of a day; others had a similar number of carbuncles; others had both buboes and carbuncles, which generally appeared in the groin, under the arm, or near the breast. Those who were affected with a shivering, having no bubo, carbuncle, spots (vibices or maculæ latæ), or any other disfiguration (eruption), were invariably carried off in less than twenty-four hours; and the body of the deceased became quickly putrefied, so that it was indispensably necessary to bury it in a few hours after dissolution.

"The European merchants shut themselves up in their respective houses, as is the practice in the Levant. I did not take this precaution, but occasionally rode out to take exercise on horseback. My daily observations convinced me that the epidemy was not caught by approach, unless that approach was accompanied by an inhaling of the breath, or by touching the infected person."

This last remark is in strict agreement with the observations of the best medical writers of modern times who have witnessed the disease in different countries and climates; and the wholesome practice of drawing a line of demarcation, and thus cutting off all communication with the sick, is founded upon the same view. Assalini traces the progress of the plague among the French army in Egypt with great care, and asserts, that even those who associated with the sick were seldom affected unless inmated in their rooms, and instances the small degree of danger there is from casual intercourse by showing how very rarely the medical attendants suffered. Dr. Frank the younger, who was with the French army at the same time, visited his patients closely and frequently, but never ventured to feel their pulse.—(*De Peste, Dysenteria*, &c., 8vo., Vienn.) Baron Larrey (*Mém. de Chir. Militaire*, t. i.), however, who distinguished himself so much by his medical services in that expedition, declares that when the disease is slight, there is little or no danger, either in touching the patient's pulse, "du bout des doigts," or in opening buboes or carbuncles, or touching small portions of his body or his clothes, "par des petites surfaces;" nor even in going into his apartment, if well ventilated.]

Yet fresh persons are far less safe than the stated inhabitants of an infected place, who have been gradually inured to the influence of the morbid miasm. "Families," says Mr. Jackson, "who had retired to the country to avoid the infection, on returning to town, when all infection had apparently ceased, were generally attacked and died. After the mortality had subsided at Mogadore, a corps of troops arrived at the city of Terodant, in the province of Suse, where the plague had been raging and had subsided: these troops, after remaining three days at Mogadore, were attacked with the disease, and it raged *exclusively* among them for about a month, though they were not confined to any particular quarter, many of them

having had apartments in the houses of the inhabitants of the town."

As in the plague of Athens and of London, "the mortality," continues the same author, "was so great that the living, not having time to bury the dead, the bodies were deposited or thrown together into large holes, which, when nearly full, were covered over with earth. Young, healthy, and robust persons, with strong stamina, were for the most part attacked first, then women and children, and lastly, thin, sickly, emaciated, and old people." The depressing passions of fear and grief had also a strong predisposing effect: a few suffered twice. Morocco lost a thousand upon an average daily, when the infection was at its height, being about the maximum that fell at London; Old and New Fez from twelve to fifteen hundred; Terodant about eight hundred. The total loss sustained in these three cities and in Mogadore was estimated at one hundred and twenty-four thousand five hundred souls: not quite equalling, however, the mortality that desolated the coast of Provence from the same disease in 1720–1, and particularly the three towns of Marseilles, Toulon, and Aix, in which the first of these lost half of its inhabitants in a short time, and the second sixteen thousand out of a population of twenty-six thousand, the destruction throughout the entire province amounting to two hundred thousand souls: but this was before the laws of quarantine were perfected and rigidly carried into execution. Dr. L. Frank calculates the average population of Cairo at three hundred thousand, and its annual mortality from plague at seven thousand: yet, when the disease proves very mild, he thinks it may not be more than a fifth part of this number.

In the regular progress of the disease, buboes make their appearance first, and about the second or third day from the attack; then carbuncles and ignis sacer, if either of these occur at all; and lastly, as the danger increases, petechiæ and vibices. But, as already observed, where the plague shows great malignity from the first, it opens with petechiæ and vibices, and sometimes kills in a few hours, even before buboes have time to appear.

Buboes, in the opinion of all the practical writers, or nearly without an exception, are a critical mark of the disease, and the natural means of conducting it to a favourable termination: "but in order," says Mertens, "to their proving beneficial, they must undergo perfect suppuration." In many instances, they neither inflame nor become painful; and in others, they suddenly disappear after having reached the size of walnuts. In the former case, they afford no relief; in the latter, death is almost sure to follow speedily. [Dr. Bancroft's mode of accounting for these facts will be hereafter noticed.] The earlier buboes make their appearance the better; and upon a free suppuration, they certainly render the patient less susceptible of the disease afterward. In the opinion of M. Sotira, indeed, and of most of the French medical staff appointed to the Egyptian expedition, they prove an indemnity for life: yet, the examples of a second attack are too numerous to allow us to adopt this opinion as a general rule.

[The fact of the occurrence of the plague in the same individual more than once, is, indeed, fully established upon the best authorities, although the point has been sometimes disputed. Merten says of the plague at Moscow, "Experientia comprobatum sit, hanc (pestem) illos non solum in variis vitæ periodis, sed et eadem epidemia, bis aut sæpius occupare potest."—(*Obs. Med.*, p. 123.)]

Mr. George Smith, surgeon of the Russian Imperial Land-Cadet corps of nobles, was twice a sufferer from the plague at Bucharest in the year 1772, as I think, and had the rare privilege to recover from both assaults. But that an exemption for a considerable term of time is hereby very generally obtained, is established by innumerable examples, of which M. Mathias Degio, one of the surgeons attached to the same establishment, affords us a striking instance in his own person. "Perceiving," says Dr. Guthrie, "the gentlemen of his profession condemned, in a manner, to death, if punctual in their duty, he had the resolution to inoculate himself for the plague, in a full confidence of its efficacy; and ever afterward found himself invulnerable, while his companions around him were falling victims to its fury."—(*Guthrie on the Plague*, &c., *in Edin. Med. Commen.*, vol. viii., p. 348.) And to the same effect we are informed by Dr. P. Russell, that, in four thousand four hundred cases of infection, he only met with twenty-eight of a well-ascertained renewal of disease.—(*Treatise*, &c., p. 190.)

[The contagion of the plague, like that of typhus, and unlike that of smallpox, may infect a person a second time, though his chance of being so attacked is very considerably diminished. Dr. Bancroft says, "Two cases of reinfection, or second attacks of plague, fell under my observation in Egypt; one occurred in Mr. Webster, then an assistant surgeon, and the other in a soldier of the 27th regiment, each of whom had a bubo: they were, however, but slightly indisposed, the weather having become hot. Dr. Buchan had a second attack, but with only a small carbuncle, as he informed me. Dr. Price had also a second attack, without either a bubo or carbuncle, but, according to his own account, with a violent affection of the head and nervous system. In general (he adds), I think second attacks are milder than the first, though Dr. Price informed me of his having seen a lad, who, under such an attack, died on the second day. Pugnet says, that reinfections, when they occurred, were most frequent in persons who had been mildly treated by the first attack; and that several of these had the disease very violently the second time, immediately after using the bed or blanket of persons who had died of it."—(*Bancroft on Yellow Fever*, &c., p. 599.)

Looking at the general tenour of the evidence on the point before us, it may be concluded that a second infection is not a common event, at least during the same epidemic. In above 120 pestilential cases recorded by Diemerbroeck,

there are only two in which the patients had been infected twice during the same season.—(*De Peste*, lib. iv., hist. 37, et 45.)

Thucydides, in his account of the plague at Athens, mentions, "that those who recovered had much compassion on those who were dying and those who lay sick, as having known the misery themselves, and *were now in a secure condition, for it never seized the same person twice*, so as to be fatal." This confidence of the convalescents in their security (which is not usual in cases of the true plague when epidemic), is sometimes regarded as a confirmation of the suspicion, that the plague of Athens was the smallpox; against which inference, however, our author has zealously adduced every reason that it is possible to urge.]

Of the efficacy of inoculation from the virus of a bubo there can be no question, and we have hence a sufficient proof of the specific character of the eruption; but it is not always a successful efficacy; and even where it is so, as the extent of the immunity is not sufficiently ascertained, inoculation for the plague is by no means to be recommended. We are told by Sir John Webb of a bold experimenter, in the person of a young physician and hospital surgeon attached to the British army at Rosetta in 1802; who, to determine the question whether the bubonous virus of the plague be or be not a specific and propagable poison, inoculated himself at El-Hamed, on January 3d, twice by friction from the matter of a bubo, and once on the ensuing day, by incision. He was attacked with rigour and other symptoms of fever on the evening of the 6th of the same month, which proved to be the plague, became delirious on the 8th, and continued in this state till the evening of the 9th, when he expired.—(*Med. Trans.*, vol. vi., art. viii.)

I gladly avail myself of this authentic narrative of the Director General of the Ordnance Medical Department, in confirmation of the general statement here offered; and as containing, if a feeling of high esteem and friendship have not unduly biased my judgment, one of the most valuable documents we possess on the subject, particularly in respect to the best practical means of opposing the influence of this desolating scourge upon a large scale.

Sir John Webb's narrative embraces the history and progress of the plague, as it appeared in the British army employed in the conquest of Egypt in the years 1801, 1802, and 1803, during the whole of which time he was present, and actively engaged in arresting its course: and it justifies us in drawing the following conclusions:—Firstly, that the disease is specifically contagious. Secondly, that the atmosphere of contagion is very limited, and that hence it is by no means difficult to avoid being infected. Thirdly, that the disease makes its attacks with very different degrees of malignity, at different seasons of the year, and on different constitutions. And, fourthly, that those who reside in a place in which the plague exists, and have been gradually inured to the influence of the pestilential miasm, are less disposed to be affected by it than those who are fresh to its poison; and, as in the case of the jail-fever, may carry about them, in their clothes, effluvium enough to infect those who come within its atmosphere, while they themselves remain in a state of health.

The first position is sufficiently proved, not only by the test of inoculation just adverted to, but by numberless other facts, of which one of the most forcible is the following. A lieutenant of the 10th regiment of foot, residing in Alexandria, was attacked with the disease, and conveyed within the boundary of the quarantine. A rent having been made in a moscheto curtain, it was taken without his knowledge, by John Lee, a private, and servant to the lieutenant, who prevailed on the sentinel to let him pass, in direct violation of orders, to another private of the same regiment, of the name of William Bower, to be repaired; after which, Lee immediately carried it home, and, at his own request, accompanied his master into the pest-hospital, and attended him till he recovered. On the fourteenth day after this visit of Lee to Bower, the latter was taken ill with very suspicious symptoms, which, on the idea that it was an attack of plague, could be accounted for by no one till the application to repair the moscheto curtain was recollected by the patient. The suspicions were confirmed on next morning, and in the evening he died.

So long, however, as the line of separation was faithfully maintained, and the sound and the diseased were thus kept distinct, there was scarcely an instance in which the disease broke out among the former. I say scarcely an instance, because an anomalous case or two occurred occasionally. But such was the judgment and the vigilance exerted from first to last, that the Board of Health were able to trace almost every instance of fever to the source from which it was derived, notwithstanding the difficulty of maintaining a rigid and permanent prohibition of all communication whatever. And hence it is most probable, that the few exceptions to the general fact proceeded from a disobedience of orders which the Board were not able to detect.

In general, Sir John Webb observes, that the course of the disease is nearly the same every year, and equally varies in different seasons of the year. In Egypt it commences in November, at which time it rages with its mostly deadly malignity, "and those who are affected by it sink into the grave almost without complaint." It continues its ravages with little abatement through the winter and the earlier part of the spring, when, as the weather becomes warmer by the approach of summer, its attacks are less frequent, its symptoms much milder, and it subsides into a manageable malady; still, however, retaining the characteristic test of glandular affection: and, on the 24th of June, the Turkish government announces to the public its supposed cessation by a discharge of cannon; the atmospheric temperature being now acquired, in which the matter of plague ceases to operate.

Sir John, however, with great judgment, en-

tertains doubts of its entire cessation, even then or at any time; and brings a proof or two of its existence during the period of official emancipation. In few words, he conceives the plague to exist in Egypt as the smallpox exists in England; only, from a greater regularity in the atmospheric changes of the country, evincing a greater regularity of epidemic flux and reflux, operated upon at the same time by contingencies often difficult to be developed; and hence equally varying in violence and extent.

That the miasm of plague, like that of typhus, is sometimes inert upon those habituated to its influence, is obvious from the following fact. "When our pest establishment at the camp was broken up, I discovered that the Arab servants who had been employed in it had secreted a great part of the clothing of the men who had died of the plague; some of which they wore with great satisfaction and *perfect impunity*." I have noticed this effect of habit in the preceding view of the plague at Mogadore: and to the same cause Sir John Webb ascribes it that the Chasseurs Britanniques, on their first arrival at Alexandria from Trieste, suffered far more severely from the disease than the troops that had been stationed there for some months.*

[Dr. L. Frank (*De Peste, Dysenteria, et Ophthalmia Ægyptiaca*, Vindob., 1820) has published several striking examples of the sudden disappearance and occasional inertness of plague contagion. The French army arrived at Cairo in 1798, only thirty days after the cessation of a severe plague; and though, in the hospitals, the beds, clothes, &c., of the Mamalukes were made use of, not a single case of plague occurred during that year. Upon this subject, as Dr. Winterbottom has noticed, Dr. Wolmar informs us, that about the summer solstice the south winds and sirocco, which had prevailed during the time of the plague, ceased, and were succeeded by north and northeast winds. A heavy dew fell every night, and the disease disappeared. The Europeans, many Christian merchants, and the Cophts, now opened again their enclosures, and many days were passed merely in visiting. The Turks, also, visited to congratulate each other, and to renew their commercial ties. The Europeans and native Christians paid visits of condolence to the Turks in their houses; on which occasion they seated themselves, without dread, upon sofas covered with cotton, which, but a few days before, would have infallibly communicated to them the plague; though, at this time, such an occurrence was not heard of—a sufficient proof how great the influence of the atmosphere is over this disease.† Moreover, soon after the battle of the pyramids, Bonaparte and his staff occupied the quarters of Murad Bey; in which, a short time previously, sixty men had died of plague, yet none of the French suffered from contagion. Pugnet also informs us, that Bonaparte, in order to lessen the fears of the soldiers, used to touch the bodies infected with plague. Upon this subject, Desgenettes more particularly says:—"Se trouvant (le général-en-chèf) dans une chambre étroite et très encombrée, il aida à soulever le cadavre hideux d'un soldat, dont les habits en lambeaux etoient souillés par l'ouverture d'un bubon abscedé."—(*Hist. Méd. de l'Armée d'Orient*, p. 49; and *Winterbottom, in Edin. Med. Journ.*, vol. xxx., p. 331.)]

How slightly the disease makes its assault upon some constitutions may be inferred from the case of one of the sailors of the Major transport, who was attacked towards the end of March with an inguinal bubo, but was otherwise *in perfect health*. "The man," says Sir John Webb, "declared he had had it three days, and attributed it to cold. I was, however, satisfied, after a careful inquiry into his case, and an examination of his leg and thigh of the same side, that it was an effect of pestilential contagion, but in its mildest form. He was therefore placed in a separate tent, and a gentle aperient was administered, which was all the medicine he required. On the 2d of April I found the swelling had begun to diminish, which it continued to do until it entirely disappeared."*

The following description is of a different character. It is written with a touching simplicity that does credit to the author's heart, and will not be read without feeling by the most torpid. "As I approached the beach to examine them (the sick and suspected of the Major transport), the first object that presented itself was a young woman supported in a chair (Francisca Kennis,) moaning under oppressive disease. She stared wildly about, quite insensible to every object around her, and there was a muddy glistening in her eyes, which I had seen described but had never before observed. Her husband stood over her in the deepest distress, and held a lovely infant to her breast, who tranquilly sucked the poison that soon afterward destroyed him. I feared, at first, that force would be necessary to separate the father from his wife and child, but he at length yielded to entreaty, and was removed from the infection, though too late to save his life. She was conveyed to the pest-hospital, where she soon expired; and the child was confided to an Arab, who fed and watched over it with the greatest care. On the 28th of March, the fifteenth day after the separation took place, the infant was attacked with plague, and languished until [illegible]

* Compare Dr. Patrick Russell's Treatise on the Plague, book i., chap. iv. (Aleppo), p. 19, 4to., 1791.

† Enrico di Wolmar, Abhandl-ueber die Pest, Berlin, 1827. This work, according to Dr. Winterbottom, is extremely interesting, and contains the author's remarks on the plague, made during four epidemics, which occurred in a residence of fourteen years at Cairo and Constantinople.—See Edin. Med. Journ., vol. xxx., p. 64.—ED.

* Where buboes or carbuncles constitute the main symptoms, the patients are sometimes able to walk about and follow their usual employments, unless prevented by the degree of inflammation in the groin. Among the French soldiers whom Bonaparte led into Syria, several, while ill of plague, were able to march a considerable time—(See Foderé in Dict. Des Sciences Méd., vol xli., p. 77.) Similar facts are recorded by Diemerbroeck.—ED.

14th of April, when death terminated its sufferings."

Upon an average, from a table of the general return of the loss sustained by the British army from the plague, during the conquest and evacuation of Egypt, from the 8th of March, 1801, to the 8th of March, 1803, comprising just two years, it appears that the whole number of sick was 660:—of whom 361 died, and 299 were discharged cured: making the deaths rather more than half the number attacked. And further, that of the above 660, 612 were seized between March 8th, 1801, and June 30th, 1802, being nearly sixteen months; and only 48 between July 1st, 1802, and March 8th, 1803, including the remainder of the time: a result which reflects a very high degree of credit on the means resorted to on the occasion, and on the vigilance and activity with which they were carried into execution: 361 being the entire loss sustained from this fatal scourge operating through a period of two years: while in the French army in the same quarter, as we learn from M. Desgenettes, not more than one in three of those that suffered were fortunate enough to recover; and, according to Dr. L. Frank, not more than one in five.

Such is the history of plague, as it has shown itself in different ages and parts of the world, collected from the writings of unimpeachable eyewitnesses of its progress. In the midst of many discrepances, it exhibits a sufficient identity of character; and I have dwelt upon it the more largely, because, from the time of Dr. Cullen to the present day, its discrepances have been chiefly attended to. And hence, while some writers of respectability have attempted to divest it of one, and others of another of its peculiar and most striking attributes, as that of contagion,* or that of atmospheric influence (*Sir Brooke Faulkner; Tully, Hist. of Plague in the Islands of Malta, Goza, Corfu*, &c., 8vo., 1821), some, and especially Professor Frank (*J. P. Frank, De Cur. Morb. Hom. Epit.*, tom. i., p. 136, 8vo., Mannh., 1792), have been equally inclined to sweep the whole away at once, and to reduce it to a mere modification of typhus, or some other fever of great malignity;† on which account, in Swediaur's Nosology, it is placed next to typhus in the class of continued fevers, instead of in that of exanthems; and is distinguished by the name of loimopyra.—(*Nov. Nos. Med. Syst.*, i., 23.)

From its history, then, let us endeavour to collect its pathology, or the laws by which it is governed, and which connect it with or separate it from other exanthems.

In the first place it is obvious, that the plague, like many other febrile eruptions, is under the occasional influence of various concomitant circumstances that give a considerable diversity to many of its features. Its proper fever is an acute typhus; but even this, by the constitution of the individual, or the peculiar state of the atmosphere, sometimes changes to a remittent, and even to an inflammatory type. So the measles and smallpox, whose proper fever is a causus, sometimes change, as we have already seen, into a typhus or synochus. The final end of the fever in plague, as in other exanthems, is to restore the body to health by throwing the morbid ferment to the surface in a specific way. And, as in other exanthems also, a very small degree of fever is requisite for this purpose. And hence we find, that, wherever the disease runs through its progress kindly, the fever is slight in degree and short in continuance; and the specific eruption shows itself in its perfect character. Dr. Frank the younger tells us of a patient, who even danced and was merry at the very time when he had a bubo forming in the right axilla.—(*De Peste, Dysenteria*, &c., 8vo., Vienn.) In the smallpox we sometimes find scarcely any eruption, and very little disturbance of the system; and the same benign disposition is occasionally found to attend the plague; for the soldier who is struck while in the ranks with a sudden shock, or *m'drop*, as the Arabians call it, and is taken to the hospital on one day, has, in a few instances, by proper treatment, passed through the febrile assault in three or four hours, and resumed his station the day after (*Edinburgh Med. Commentaries*, vol. iii., p. 352): the disease, in such cases, evincing the same rapidity of attack and recovery which we have already noticed in that tremendous and fatal scourge, the spasmodic cholera of India.

Next, the proper eruption of plague is that of buboes; and where these alone arise, and in their proper period, the disease is not accompanied with much danger. They are always a favourable sign, and seem to afford the longest indemnity against future attacks. When the fever is more considerable, carbuncles, the jimmerat حمرات of the Arabians, are thrown out at the same time over different parts of the body; and there is in this case always great debility, which is probably the cause of their appearance, and a considerable degree of danger. And, if the fever run still higher, the danger will be proportionably increased, the proper eruption of buboes may perhaps be suppressed, and carbuncles alone be found highly malignant, and secreting a most acrid and corrosive ichor, which, as it oozes and spreads about, occasionally forms extensive trails of painful and distressing sores.

But the fever is often still more acute, and especially, for a reason we shall presently notice, when the disease first appears among a people; and the danger may be imminent from the first

* Læssis, Recherches sur les véritables Causes des Maladies Epidémiques, &c., 8vo., Paris, 1819. Lange, Rudimenta doctrinæ de peste. Magirus, Von der Pest. Maclean, Results of an Investigation respecting Epidemic and Pestilential Diseases, including Researches in the Levant concerning the Plague.

† Dr. W. Heberden, Observations on the Increase and Decrease of different Diseases, particularly the Plague, 8vo., 1801. Dr. Hancock, Researches into the Laws and Phenomena of Pestilence, &c., 8vo., 1821. Dr. L. Frank, De Peste, Dysenteria, &c., 8vo., Vienn., 1822.

shock. The typhous symptoms are here of the most malignant nature: there is a sudden and almost utter exhaustion of sensorial power without the smallest means of recruit: all the larger viscera are disturbed in their functions; the head, the heart, the lungs, the stomach, and the liver: some overwhelmed with congestion, others sinking and powerless, as though the morbid virus were translated from the surface to themselves; the only active principle throughout the entire system being that of fever itself, which increases with the increase of the general mischief, and, like a house on fire, gathers fuel from the downfall of the fabric. All the symptoms of putrefaction make an early appearance, and appear at the same time under these circumstances: the animal spirits fail and are despondent; the respiration is anxious and feeble; the stomach faint and sinking, or the brain comatose; purple stigmata and vibices are scattered over the body, and the patient is destroyed by the incursion of the eruptive fever, as often happens in the smallpox, before the specific tokens have time to show themselves.

Of the primary source of plague we are in as much uncertainty as in respect to that of any other exanthem: it appears, however, to have a just claim to a higher antiquity than any of them; for we have already seen that it was known in an early era to the Greeks, and that histories of it, as it has shown itself in different ages and countries, have descended in a regular stream of Greek, Arabic, Roman, and neoteric writers down to our own day. We might, indeed, if it were necessary, ascend to a far remoter period, and prove its existence in the earliest ages of the Jewish history, for it is very frequently referred to in the Pentateuch under the name of DEBER (דבר), (*Exod.* v., 3, et alibi), and is more particularly described in the prophetic writings as DEBER MIZRAIM (מצרים דבר or כדרך מצרים דבר), (*Amos* iv., 10), the PLAGUE OF EGYPT, THE PLAGUE PROCEEDING FROM EGYPT; thus pointedly adverting to what was equally regarded as its indigenous soil by the Greeks (*Lucr.* vi., 1139, who quotes from Thucydides) and Barbarians, as well as by the Jews; while the carbuncular variety is also peculiarly distinguished and characterized by the name of Shechin perech (שחין פרח), (*Exod.* ix., 9), "BURNING CARBUNCLE," and Shechin Mizraim (שחין מצרים), (*Deut.* xxviii., 27), CARBUNCLE OF EGYPT. That, like other exanthems, it consists in and is propagable by a specific virus, is unquestionable; for we have already seen that it has often been put to the test of inoculation; and, like most other exanthems also, it appears to be dependant for an extensive spread upon the same accessories as give rise to febrile miasm or contagion, and which, as before noticed, are, for the most part, the common auxiliaries of putrefaction. Whether any combination of these be capable of originating it of themselves, either without or within the human body, or whether it be only propagable by a stream of hereditary descent from primary matter communicated from place to place, is a problem to the present hour, though it is probable that the principle which in this respect governs most of the other exanthems, as measles, smallpox, and scarlet fever, governs the miasm of plague also: for all of them, while derivable by communication with the affected, seem at times to have assumed the form of epidemics.

In deducing the more obvious laws that regulate febrile miasm, I observed at some length, that, whenever originating from the human body itself, this miasm does not seem to be very volatile, and is soon dissolved or decomposed in an atmosphere of pure air: and we have since had occasion to apply the same remark to the specific miasms of all the preceding exanthems. I have now to observe that it applies especially to that of plague, whose sphere of infection in pure air seems to be more limited than any of the rest; on which account, indeed, it has been held by many who have practised in the field of this disease to be communicable by contact alone. Such, in truth, seems to be the surest way of communication, and may, in all common cases, be regarded as a way altogether irresistible: but it is not the only way. In the pure and healthy air of Malta, during the visitation of the plague in 1813, it was almost the only mode of transmission; and hence the readiness with which it was subdued by the rigid line of quarantine which was so wisely proposed by the medical officers, and enforced by Sir Thomas Maitland. But several of the most intelligent residents on the spot, and even Mr. Tully himself, who, in his work on the subject, has held up contagion as the sole means of propagation, have admitted to me, in conversation, that the disease might be received by the breath of the infected, without contact, upon a very close intercourse. Sir B. Faulkner's opinion upon this point is in perfect union with Mr. Tully's: "It is communicated," says he, "only by contact *or* close association with the person or thing infected."—(*Minutes of Evidence before the Select Committee of the House of Commons.*) And, in consequence, they admit that the air, even in its purest state, may become a vehicle of communication, though to a very short distance, and probably for a short period after being impregnated; since, as already observed, the miasm of plague dissolves in pure air with great rapidity.*

When, however, the atmosphere is stagnant, or already loaded with foul effluvia of any other kind, especially such as proceed from the filth of close or crowded rooms, or the putrescent decomposition of animal or vegetable substances, no modification of febrile miasm, as we have had reason to state antecedently, dissolves readily; and consequently the seeds of such disease may continue floating for a considerable period of time, and be driven by currents to some distance in full possession of their specific mischief; and

* Whether the plague can be received by means of respiration, must yet be regarded as an unsettled point. The celebrated Omodei observes: "A tutti è noto che il valoroso Valli, ricco d'esperienza su di questa materia, sosteneva non essere contagiosa l'aere respirata dagli appestati."—Peste di Smirne del 1784.—ED.

hence, even a sporadic fever may be converted into an epidemic.

It is in this way that plague appears in many cases to have extended itself; for it would be unjust to the character and good sense of a cloud of intelligent witnesses, to deny that this disease sometimes also assumes the form of an epidemy. But I believe it would be found a universal fact, that it has never exhibited itself in this form, except when aided by the above auxiliaries. Thus much is certain, that it has always raged with most violence, and to the greatest extent, in cities and districts where the atmosphere has been least pure, the human frame most debilitated, and the tendencies to putrefaction strongest and most multiplied, as in times of famine or any other general distress, and in the close and squalid quarters of the poor of every city into which it has found an entrance, if it have not even originated there.

This fact, indeed, is so common, that while many writers have contended that plague can only be propagated by actual contact, others, of equal authority, have maintained that the disease is altogether an epidemic, as directly dependant upon the state and constitution of the air as any epidemic whatever, and that to attempt to cure it by a mere interdict of communication between individual and individual is equally weak and wicked. The view now taken of the disease is calculated to reconcile these conflicting opinions, and to bring into a state of amity the most sturdy adversaries in the contest.* In enforcing the line of quarantine at Malta (*Treatise on the Plague, by Sir Arthur Brooke Faulkner, M. D.*, 8vo., 1820), Sir Brooke Faulkner most wisely took especial care to enforce at the same time a rigid attention to purification of every kind; and I shrewdly suspect that, without the latter, his cordon would have been but of little avail.

Thus far, the ordinary course of plague does not essentially vary from that of most of the exanthems already considered. The general laws of any one are those of the whole: they are all deflected, and exhibit some variety of features by particular circumstances; but each, to an attentive eye, gives sufficient proofs of identity in the midst of every modification, and is specifically distinguished from the rest.

There are two or three properties, however, which, if not peculiar to the plague, are indented upon it far more strikingly than upon any other disease of the same order, or perhaps of any order whatever: and we will next proceed to a brief examination of them.

The ordinary mode of infection, on exposure to an exanthematous patient, is by inhalation or deglutition; probably by the former; for variolous contagion has been swallowed in the way of experiment without producing any influence. How far any other virus, besides that of the plague, is receivable by the pores of a sound skin, is to this hour a matter of doubt. In the case of plague, however, there ought not to exist the shadow of a doubt; for though the miasm is probably communicable within the sphere of its activity, by the mouth or nostrils, direct contact or absorption by the skin forms the ordinary means of its conveyance. Upon this point, almost all the writers of authority, who have been professionally engaged in opposing its progress, are concurrent. And hence again, whatever obstructs or corrugates the mouths of the cutaneous absorbents becomes a certain anti-loimic. Oil seems to do this most effectually; it was accounted "the sovereignest thing on earth" in the last pestilent ravage at Noya, where the physicians, inspectors, and commissaries uniformly wore oil-skin caps, mantles, masks, and gloves.—(*Giornale di tutti Atti, Discussioni*, &c., Napoli, 1816.) At Malta, it was in equal favour: and Mr. Tully has informed me, that there was no instance of an attendant on the infected having received the contagion so long as he was regular in thoroughly rubbing himself with oil, wearing a dress soaked in oil, or a covering of oil-skin. And to the same effect is the evidence of Sir Brooke Faulkner, physician to the forces at Malta in 1813, before the Select Committee of the House of Commons, June 14, 1819, who, in answer to the question, "How were the military attendants preserved?" replied, "With respect to the pest-hospital in which I attended, they were in my opinion preserved by wearing a dress of oiled silk, which prevented the possibility of any contact of infected matter with the skin, and probably also by its promoting free and copious perspiration, and in consequence preventing absorption."—(*Copy of Minutes*, &c. As also *Sir A. B. Faulkner's Treatise on the Plague*, &c., Appendix, p. 16, 8vo., 1820.)

To the same effect it has been asserted by Mr. Baldwin, of Cairo, that among upwards of a million of inhabitants carried off by the plague in Upper and Lower Egypt during the space of four years, not a single dealer in oil, so far as he could learn, had fallen a sacrifice to it.—(*Travels*, &c., chap. xvii.) A similar remark is made by Mr. Jackson, respecting the crolies or labourers in oil-warehouses during the Barbary plague. In that of London in 1665, it is specially observed by Baynard and most of the writers, that the trades chiefly exempted were those of oilmen, fishmongers, tanners, bargemen, and watermen: the first three evidently protected by the greasy viscidity that covered the hands and dress generally; and the last two by living separate from the scene of contamination, as though cut off by a quarantine.

* The principal difficulty in the way of an unqualified admission of the contagious nature of the plague, is the complete and often speedy eradication of the disease, in a place where no particular means of purification have been employed for the removal or destruction of the contagion. "But," as Dr. Bateman observes, "this difficulty is not insurmountable, as might be illustrated by a reference to the progress of those contagious diseases which admit of no dispute, such as the smallpox and measles. For even these are only widely epidemic and severely fatal at particular seasons, when circumstances that are not always cognizable give a peculiar virulence to the contagion, or a predisposition to the human constitution to receive its influence."—(Rees's Cyclop., art. Plague.)

While, on the contrary, it has been quite as generally remarked, that the description of persons most exposed to infection are bakers, cooks, and smiths, the pores of whose skin are kept in a state of perpetual irritation and relaxation from their respective employments.

How far an habitual exposure to the miasms of other exanthems torpefies the skin to their action, or whatever other organ affords them an inlet; or how far the system at large may be thus torpefied, has not been determined with any degree of satisfaction. That stimulants of most kinds have a tendency to produce such torpitude and inirritability is unquestionable; and that the miasm of jail fever has occasionally done it, will not soon be forgotten in the courts of judicature of our own country. It is hence probable, that the effluvium of exanthems in general is possessed of a like power. But in the case of plague, the fact seems to be unequivocally and most strikingly established; for we find in every country, after it has raged for a certain number of weeks or months, that the disease is both caught more sparingly, and exercises far less violence, at least upon those that have been exposed to its aura; for upon newcomers, or strangers, it still retains its virulence. The history of almost every plague may be taken in confirmation of this remark; but it is particularly established by numerous facts already quoted from Sir John Webb and Mr. Jackson. It is highly probable, that if the corps of troops which, after the mortality had subsided at Mogadore, arrived there from the city of Terodant in the province of Suse, *where the plague had been raging* and had subsided, had remained at Terodant, it would have continued to escape. But it lost its immunity by an exchange of contaminated for pure air in the course of its journey, and the organs having acquired their wonted irritability and susceptibility, were as open to infection as those of fresh persons.

The acquisition then of a growing torpitude to the action of the pestilential effluvium beneath a habit of exposure to its influence, seems unquestionable; and puts us in possession of one means of the progressive subsidence of this tremendous scourge, after having occupied a town or district for a certain period of time.

But there is an additional cause of its cessation, which is equally striking, and forms another of the peculiar features of this complaint. As a particular state of the atmosphere, such, for instance, as its being saturated with foreign corpuscles from decomposing animal filth, renders it a bad solvent of pestilential miasm, and consequently a ready vehicle for the spread of the disease, a particular state of the atmosphere of some other kind seems to possess a power of dissolving the effluvium instantaneously, in many cases, and of diluting or disarming its virulence in others. Of the immediate nature of this atmospheric change, we are in a considerable degree of ignorance, but of the general fact there is not a quarter of the world that does not furnish us with examples: so that, all of a sudden, the scourge that had hitherto been sweeping off one or two thousand inhabitants of a city every day, either totally vanishes, or drops its mortality, and only continues in a form so mild as to excite no alarm. Dr. Hodges notices this sudden change very particularly in the plague of London. "In the beginning of November," says he, "people grew more healthy, and many came into the city without fear; so that in December they crowded back as thick as they fled: and such confidence was now inspired, that many went into the beds where persons had died, before they were cold, or cleansed from the stench of the diseased; *for the nature of the disorder was changed.*"—(*Loimol.*, p. 27.) "Even the physicians themselves," says another eyewitness of the same pestilence, "were surprised: wherever they visited, they found their patients better. Either they had sweated kindly, or the tumours were broken, or the carbuncles went down, and the inflammation round them changed colour, or the fever was gone, or the violent headache assuaged, or some good symptom was in the case: so that in a few days whole families that expected death every hour were revived and healed, and none died at all out of them."—(*Journal by H. F.*, p. 250.)

Alpinus speaks in the same manner of the sudden decline of mortality in the plague of Egypt: "In the month of June," says he, "to whatever degree pestilence may be raging in Egypt, as soon as the sun enters Cancer, it ceases entirely." And Dr. Russell confirms this remark as follows:—"It is agreed on all hands, that about the 24th of June, at Cairo, there is a remarkable sudden alteration in the contagious property of the plague, as well as in the malignity of the disease itself, to whatever cause it is to be ascribed: and Alpinus's remark, that at the same time it ceases, the furniture in infected houses suddenly loses all power of communicating the disease to the inhabitants, so that health and tranquillity are at once restored, agrees in some measure with the general experience of other places in Turkey, where, it is well known, houses or goods undergo little or no purification."—(*On the Plague*, b. iii., ch. v.) Mr. Bruce speaks to the same effect:—"The Turks and Moors, immediately after this day, expose in the market-places the clothes of the many thousands that have died of the plague during its late continuance; and though these consist of fur, cotton, silk, and woollen cloths, which are stuffs the most retentive of the infection, no accident happens to those who wear them, from their happy confidence." And we are hence able to enter more fully into the meaning of a passage already quoted from Sir John Webb, in which he tells us, that, on the approach of summer, the plague subsides into a manageable malady, and that, on the 24th of June, the Turkish government announces to the public its supposed cessation by a discharge of cannon.

Unless, therefore, we withhold, most unjustly, all belief in this accumulation of unimpeachable evidence, it seems impossible not to admit that the state, or, to speak more definitely, the

temperature of the atmosphere is connected with the decline of the plague, and consequently with its previous progress; and that, as already observed, it cannot maintain its energy, nor perhaps exist under an atmospheric heat of 60°,* nor above that of 80°; while its dependance upon a specific miasm seems equally clear from its occasionally commencing in the healthiest, as well as in unhealthy seasons; though most frequently, and most fatally, in the latter. In the plague of London, as we have already seen, the disease followed a malignant epidemy; in that of Athens, the preceding year had been so peculiarly healthy, that mankind seemed to have acquired an exemption from complaints of every kind. In that of Egypt it makes a regular return, whatever be the constitution of the season. Dr. L. Frank, in one place, ascribes the diminution of the fatal power of the plague to a periodical return of the north wind: but he afterward observes, that winds, at times, or even moisture, seem to have little influence upon it. That the change in its degree of activity is connected with the change which takes place in the temperature of the atmosphere, is unquestionable; and it is highly probable, that it is dependant upon this alone. That below 60°, or in the cold of the winter months, the miasmic corpuscles lose their volatility, and gradually become decomposed; while above 80°, as in the summer months of Egypt and Arabia, they become almost immediately dissolved; so that clothes and bedding, however loaded with them, are rendered harmless. And hence the reason why it has never been known either in the tropical or arctic regions.

Respecting the proper plan to be pursued, there is still some controversy. Early, copious, and even repeated venesection was at one time, and by very high authorities, recommended in this disease, and especially by Sydenham at the commencement of the plague of London, in 1665 and 1666, before the appearance of any eruption. Like Dr. Rush, in North America, respecting the yellow fever, he was stimulated by the bold determination of quelling this formidable enemy in its very onset, and before it should have made a fatal breach in the constitution. This practice, however, has been far less successful, and therefore less persevered in, with regard to the plague, than with regard to the yellow remittent. Dr. Mergens says, he would never advise its being resorted to; and even Sydenham hesitated as he became more experienced. "But though," says he, "I approve, and have often experienced the utility of bleeding, yet, for several reasons, I prefer the dissipation of the pestilential ferment by sweat, because sweating does not in the same degree prostrate the patient's strength." Bloodletting and purgatives, Dr. L. Frank assures us, prove equally hurtful in the plague of Egypt. During the plague at Noya, the doctrines of Dr. Brown were in high vogue, and the disease was divided into sthenic and asthenic; free bleeding and large doses of calomel being prescribed for the former; and acids, opium, ether, and other stimulants for the latter. But, in general, the medical practice was here as confused and inconsistent as the precautionary means of the police were excellent and effective, so that Romani was right in affirming that, after all, their real alexipharmic was to be found in God alone.—(*Ricordi sulla Peste, da F. Romani, M. D.*, Napoli, 1816.) Wherever there is great and threatening congestion in a large or vital organ, early bleeding should certainly be employed; and is, in such cases, wisely recommended by the elder Frank.—(*De Cur. Hom. Morb. Epit.*, tom. i., p. 136.) But the practice must form an exception to the general rule, and not the rule itself. In general, as Dr. Bancroft says, very bad effects have resulted from this evacuation.

The use of external cold by the application of sheets of pounded ice to the body generally, has been also tried, but with no satisfactory result. It has, indeed, been chiefly confined to Russia, under the vigilant eye of M. Samoilowitz. How far it might succeed in warmer climates is uncertain, but ablution with cold water offers a fairer promise. [According to Dr. Bancroft, however, the unsuccessful trials of the cold bath in Egypt afford no encouragement to repeat them.] A brisk emetic, given at the commencement of the attack, has often proved of the utmost advantage. M. Degio, to whom I have already adverted, affirms that he has seen men suddenly cut down by the disease when on duty, as though shot by a musket ball, so completely recovered by an emetic given instantly, as to be on duty again within twenty-four hours afterward.* If the nausea and bitter taste in the mouth be not removed by a first emetic, a second, and even a third are often prescribed; and where the symptoms are urgent, at a distance of not more than four or five hours from each other. And this plan is found to produce far less exhaustion than that of purging, which the patient is often unable to support.

After evacuating the stomach, and hereby exciting a determination towards the skin, the cutaneous action is to be maintained by active and cordial sudorifics, which, indeed, constitute the ordinary plan of the present day. For cordials, there is the utmost necessity: the debility is, from the first, extreme and threatening, and

* The only fact with which the editor is acquainted, in opposition to this doctrine, is that of Mindererus, who was an eyewitness of the plague of Ismail, during the most severe winter ever remembered there.—(Account of the Turkish Empire.) Dr. Winterbottom, in noticing the differences between the plague and yellow fever, says, that the former can maintain itself in excessive degrees of cold, while, on the contrary, a changeable temperature, inclining to cold, is destructive of yellow fever.—See Edin. Med. Journ., vol. xxx., p. 340.

* Substance of notes taken at the Russian army during the prevalence of the plague.—See Edin. Med. Comm., vol. viii., p. 352.

the vascular action must be supported at all adventures. Even Sydenham, who at one time hesitated as to the use of them upon theory, in which he did not often indulge, was obliged to admit their beneficial effects, though he regarded the practice as hazardous. With respect to sudorifics, the concurrent voice of all physicians in all countries is in their favour. Diaphoresis is, indeed, the evacuation that relieves most certainly and most effectually; and it should be maintained by warm, diluent, and supporting drinks. James's powder employed without cordials does not appear advisable. It was very largely administered at Moscow, but according to Dr. Mergens, with no particular advantage. In many cases the warmer opiates, as the opiate confection, have been found serviceable, assisted with camphire and ammonia, and blisters repeated in succession.

As oils of all kinds, applied to the surface of the body, have been found a good preservative against the absorption of the contagious miasm, it has been also had recourse to, and employed in the same manner as an antidote when the disease is present, and particularly in the east, where the zeit jagghy زيت ياغى, or olive-oil, has been regarded almost as a specific. Mr. Baldwin affirms, that he made use of it in this form very extensively at Cairo, and with great success: and it is usually employed in Barbary and at Constantinople. The French physicians, however, do not seem to have relied much upon its virtue. M. Sotira suggests, that Mr. Baldwin's benevolence in the distribution of oil for this purpose was occasionally abused, and the cures by oil exaggerated and multiplied by those who wished to have oil gratis. Assilini, however, inclines to a belief that it may be useful: it is most pointedly recommended by Father Louis of Padua, director of the hospitals at Smyrna: and quite as strongly by Dr. Pauvini of Palermo, who had practised indeed at Malta, but whose work was reprinted during the plague at Noya, and gave a character to the medical practice pursued in that city.* The application should be accompanied with a long-continued friction; and, when successful, is followed in about half an hour by a perspiration profuse and general, and which affords immediate relief. Sir Brooke Faulkner admits its sudorific power, but is by no means friendly to its use: believing that even by this very power it has often proved highly injurious. Yet he does not speak from much personal acquaintance with its effects; but tells us that "a gentleman who superintended the health of one of the districts of Valetta assured *him* that, although he had constant opportunities of seeing oil frictions used by those under his immediate orders, he was satisfied that it was not merely useless *as a defence*, but hurtful to the general health, by the debility which succeeded to the profuse perspirations which it occasioned."

* Chiara Dimostrazione de veri Preservativi della Peste e de Remedj, &c., del Sacerdote P. Pauvini, Dottore in Medicina, &c., Palermo, 1813.

[Pugnet says, that oil frictions, so extensively employed by the French physicians in Egypt, were not only useless, but caused anxiety and disturbance to the sick; and that of fifteen patients to whom they were applied, under Dr. Carrie, one recovered with difficulty, and all the rest died; and that where they seemed to do good, the disease was always mild. With so much reason to doubt of their efficacy, there is a strong objection to their use, arising from the very great danger of communicating the disease to the person by whose hands they may be applied.—(*Bancroft on Yellow Fever*, &c., p. 623.)] Sir Brooke, in the passage of his book above referred to, estimates its prophylactic virtue as low as its remedial (*Treatise on the Plague*, &c., pp. 231, 232), and is thus far in a state of direct antagonism, not only with Mr. Tully, who was afterward inspector of quarantine on the same station, but with himself at the time of delivering his evidence before the Select Committee of the House of Commons; an extract from which we have already quoted. Dr. L. Frank employed oil, according to his own statement, with great and decided success. In his hands it proved a most salutary sudorific; and to sudorifics he principally trusted. He used it in the form of friction, six ounces at a time, and a single friction a day.

In the remissions of the fever, the bark is used in great abundance, commonly intermixed with port, or other generous wines. During the fatal plague which depopulated the whole of Western Barbary in 1799, the Emperor Sidi Soliman is said to have had the disease twice, and in both cases to have derived his cure from a free use of the bark; in consequence of which he was never afterward without a large supply of it. When buboes or carbuncles appear, they are always to be promoted and matured by warm cataplasms.

[With respect to the management of buboes, although it may be right to promote their suppuration by emollient cataplasms, where a natural tendency to that issue is evident, it is fully ascertained that there is no danger in favouring their dispersion by the usual means, when they show a disposition to recede. Dr. Bancroft says, "I know that the sudden retrocession of buboes, previous to suppuration, and while other symptoms indicating danger subsist unabated, is often followed by death. But, this mortality is not in such cases produced by any change in the bubo itself, or by the retention of any matter which ought to be discharged, but by such an extreme diminution of the living power, or other injurious effects of the disease, as is incompatible with the continuation of a suppurating process, and also with the patient's recovery; and, therefore, this retrocession is to be considered not as the cause of death, but as an indication and consequence of that condition of the patient, from which death necessarily resulted; and, on the other hand, when these glandular swellings rise and suppurate favourably, they indicate such a state of the living power and of the system as is likely to overcome the

disease, without the supposed benefit of an evacuation of morbid poison by that suppuration. The same reasoning appears applicable to carbuncles, though in their gangrenous state, and, when not surrounded by concentric inflamed rings, they require hot stimulant applications, and afterward such as will promote a suppuration, and a separation of the carbonaceous crust."—(*Bancroft on Yellow Fever*, &c., p. 617.) These observations are important, as connected with the theory, prognosis, and treatment of the disease.]

Camphire, smoking tobacco, fumigation with gum sandrac, and the vinegar of the Four Thieves, are still largely employed as preventives. But the contagion, as we have already observed, is not peculiarly active, and the best prophylactics are cleanliness, pure air, freedom from actual contact, a liberal diet, and cheerful spirits. I may add that vaccination has been repeatedly tried; but has answered no good purpose. Sir Brooke Faulkner, indeed, gives a striking example of its failure, for "in a numerous family," says he, "who had been recently vaccinated, the whole fell sacrifices to the prevailing contagion, with the exception of the parents, who had never undergone the operation."—(*Treatise on the Plague*, p. 233.)

[In relation to this part of the subject, the editor mentions with admiration the name of Valli, who, as Dr. Winterbottom observes, "appears to have been a man of a cultivated mind, and overflowing with ardour for his profession. Being an enthusiastic admirer of vaccine inoculation, and imagining that the prevalence of natural smallpox and plague was influenced by a kind of mutual repulsion between the two diseases, he flattered himself with having discovered a specific for the latter disease in the vaccine matter. To prove the truth of his opinion, he went to Constantinople, and shut himself up in a pest-house, from which he narrowly escaped with life. He made many experiments by inoculating with mixtures of smallpox, vaccine, and pestilential matters, which he promised to publish, but which it is feared are lost. Dr. Valli inoculated himself with impunity with a mixture of vaccine and plague matter. In consequence of these trials, a nostrum was advertised for sale as a preventive of plague; but it is not clear that Dr. Valli had any concern in it, at least, not from sordid motives. But an apothecary at Constantinople was accused of preparing, as a specific for plague, an ointment, composed, it was pretended, of plague and vaccine matter. The apothecary was strangled, as a just reward for his knavery. Dr. Valli ultimately went to the Havana to investigate yellow fever, the contagious nature of which he denied, where he died a few days after his landing, and where the Medical Society of that city have erected a monument to his memory. A republication of Valli's works on plague, now out of print, with a biographical sketch of the author, would, as Dr. Winterbottom says, be an interesting present to the medical world.—(*Edin. Med. Journ.*, vol. xxx., p. 332.)]

SPECIES II.

ANTHRACIA RUBULA.

YAWS.

TUMOURS NUMEROUS AND SUCCESSIVE; GRADUALLY INCREASING FROM SPECKS TO THE SIZE OF A RASPBERRY; ONE AT LENGTH GROWING LARGER THAN THE REST; CORE A FUNGOUS EXCRESCENCE: FEVER SLIGHT:* OCCURRING ONLY ONCE DURING LIFE; CONTAGIOUS.

The term RUBULA, by which this disease is distinguished in the present work, is derived from the Latin *rubus*, "a blackberry or raspberry," in French *framboise*, whence the common but barbarous name of *frambœsia*, quite as objectionable as that of *scarlatina*; and which the author has thus attempted to exchange for a euphonious and strictly classical term, in perfect concordance with the ordinary law of diminutives, which seems to prevail through the general nomenclature of exanthematous diseases, as rubeola, variola, varicella. Perhaps morula, from morus, a mulberry, a diminutive used in an approximating sense by Plautus, might have been somewhat more appropriate, since the eruption seems to bear a nearer resemblance to small mulberries than to raspberries. But as this last plant has laid a foundation for the vernacular name both on the African and American coast, on the former of which it is called *yaw*, and on the latter *pian* or *epian*, both importing raspberry; and as the earliest writers have, upon this authority, denominated it *framboise* or *frambœsia*, I have not felt myself at liberty to deviate from the original idea. Swediaur has denominated it *thymiosis*, but with less attention to the external character of the eruption. He arranges it, indeed, under the division of cachectic ulcers, and has made it synonymous with the synochus of the Greeks, as described by Celsus (Lib. vi., cap. iii.); to which it has only a few casual resemblances, while in its essential signs it is widely different. —(*Nov. Nosol. Meth. Syst.*, vol. ii., p. 180.)

The disease, as it occurs in Africa and America, exhibits some diversity, and lays a foundation for two varieties, as follow:—

α Guineensis. African Yaws.	Attacking infants and young persons chiefly; and subsiding as soon as the eruption appears.
β Americana. American Yaws.	Depascent; and destroying progressively both muscles and bones.†

* It is alleged by Mr. David Mason, that fever, so far from being necessarily connected with yaws, seldom occurs, and perhaps never, except as an adventitious disorder. Hence he prefers the arrangement of yaws in the class tubera, as adopted by Sauvages, and not Dr. Good's classification of it with *Exanthematica*.—See Edin. Med. and Surg. Journ., No. cvi., p. 54.—Ed.

† Mr. David Mason's observations, published in the Edin. Med. and Surgical Journal, No. cvi., he informs us, refer to the African variety of Dr. Good; but he thinks that there is no good foundation for the division into the African and American kinds. The disease, he believes is of a uniform

In the precursory remarks to the present genus, I have stated the reasons for introducing this species into the list of exanthems, or febrile eruptions; and the history of the disease will still further show, that it could not with propriety have been placed under any other division. It is singular, that we have no decided account of this malady among the early writers; nor, indeed, any account whatever till after the appearance of syphilis; whence, as several of its symptoms, and especially where the bones become affected, bear a resemblance to those of syphilis, yaws have been supposed by some writers to be a species of lues, and especially of that which in Scotland is denominated sibbens or sivens, of which we shall treat in the ensuing order: but the eruptive fever and consequent efflorescence, the indemnity from a second attack, as well as other symptoms, draw a sufficient line of distinction.*

The FIRST VARIETY will often run through its course favourably without any medical assistance whatever: and is, indeed, often rendered worse by the injudicious interposition of it. This seems to be the primitive form, and that under which it chiefly shows itself in Guinea, and some other parts of Africa, where, as just observed, it is vernacularly called YAW, or MORBUS RUBULUS.

It commences, like the other exanthems, with the ordinary symptoms of fever, although they are usually more tardy in their progress. Hence the precursory symptoms are languor, debility, headache, loss of appetite, rigour, and pain in the back and loins, which continue for a few days, with evening exacerbations. To these succeeds the specific eruption; consisting of successive crops of papulæ, at first not larger than a pin's head, but increasing in size with every series, till they acquire the magnitude of a raspberry or mulberry. The smaller papulæ become real pustules, and discharge an opaque whitish fluid when broken, and concrete into dense scabs or crusts. The larger are fungous excrescences, and, in their granular surface, as well as in their size and colour, bear a near resemblance to the fruit from which they derive their name. These sprouting tumours have but little sensibility, and suppurate very imperfectly; discharging rather a sordid ichor than a matured pus. They originate in scattered groups over different parts of the body, but are chiefly found, like the eruption of plague, in the groins, parotid glands, axillæ, and about the arms and pudenda: though they often disfigure the neck and face. The colouring matter of the hair, wherever they are seated, is obstructed in its secretion, and, as in old age, the hairs themselves, from a brown or a black, become a dead white. Dr. Thomas, who has given a very accurate account of this variety, apparently from personal knowledge, observes that, "in general, the number and size of the pustules are proportioned to the degree of eruptive fever. When the febrile symptoms are slight, there are few pustules; but they are mostly of a larger size than when the complaint is more violent and extensive."—(*Pract. of Phys.*, p. 643, edit. 1819.)

The duration of the eruption is uncertain, and seems to depend considerably upon the state of the habit, and its power of promoting their maturity. They sometimes acquire full perfection in four or five weeks, and sometimes demand two or three months. In their progress to this state, there is usually some one that appears larger and more prominent than the rest, and is called the master-yaw. It is, in truth, a broader and more sloughy fungus, and discharges a larger portion of erosive sanies, which, if not washed off as it issues, will spread widely, and sometimes work its way to an adjoining bone, and render it carious. When the tumours point from the soles of the feet, they cannot press through the thickness of the skin, and hence form imperfectly, and produce highly elevated calluses, which are called tubba or crab-yaws: and often very much impede the power of walking. As soon as the eruption has attained its height, the tumours, when the disease proceeds favourably, become covered with crusts or scabs, which fall off daily in whitish scales; and, in the course of a fortnight, the skin is left smooth and clean; the master-yaw alone remaining and demanding attention.

In attempting the cure of this disease, the first step should consist in separating the patient from his associates, to whom he will otherwise assuredly communicate it by contagion. He should then take freely of decoction of sarsaparilla or some other warm diluent. And it is highly probable that the warm aperient bolus, composed chiefly of a scruple of sublimed sulphur and five grains of calomel, as recommended by an anonymous writer (*Edin. Med. Essays*, vol. v., part ii., art. lxxvi.), may be found serviceable, continued every night. [In a good practical paper on yaws, Loeffler recommends sarsaparilla; and, for the purpose of promoting the eruption, small doses of ipecacuanha, camphire, warm baths, friction, and blisters.*] The master-yaw must be attacked with escharotics; for it is to be destroyed in no other way. The callous tumours on the soles of the feet (termed crab-yaws) should be softened by warm water, or cataplasms of some gentle stimulant; and, when on the point of breaking, are best subdued by a slight application of the actual cautery. The diet should be nutritious and liberal, so as to support the strength during the progress of the disease. And, under this mode of treatment, it is rarely that a patient fails to do well.†

nature, the malignant and anomalous symptoms sometimes presented by it being the result of internal constitutional, or accidental external circumstances.—ED.

* Speaking of yaws, Mr. Mason observes:—"It has some resemblance to syphilis, being slow in its progress, and only communicable by contact; but its after-effects are not so destructive, and it leaves the constitution invulnerable to future infection."—Edinb. Med. and Surg. Journ., No. cvi., p. 54.—ED.

* Meckel's Neues Archiv. der Pract. Arzeneykunde; Richter's Chir. Bibl., vol. xii., p. 340; and Winterbottom's learned paper in Edinburgh Med. Journ., vol. xxx., p. 322.

† The following is Mr. Mason's description of

Mercury was at one time given in great abundance from the commencement of the complaint, under an idea that it would prove as beneficial as in the case of lues. But it is now sufficiently known to be productive of great mischief, and particularly when carried, as it used to be, to a state of salivation. It retards the cure, and generally aggravates the symptoms. It is often given in small doses as an alterative, when the disease is on the decline, and perhaps with advantage; but it ought never to be employed in any other form.

When the excrescences discharge a sordid ichor, they may also be stimulated with the nitric-oxyde mercurial ointment: but the natives themselves, who rigidly abstain, also, from the internal use of mercury, employ, instead of this, a liniment of the rust or subcarbonate of iron and lemon-juice, which proves a very useful application; though probably a solution of sulphate of zinc might answer better. And during the maturation of the eruption, they excite a profuse sweat by what may be called a warm air-bath, which consists in putting the patient into a cask with a fire at the bottom in a brazier or small firepan; the top being covered over with a blanket. Under this mode of treatment, a cure is said to be often effected in three weeks, and the funguses thoroughly healed.—(*Edin. Med. Comm.*, vol. ii., p. 90.)

The SECOND, or AMERICAN VARIETY, is a far more terrible complaint; or rather is the same complaint in an exasperated and chronic form; and hence, though incomparably slower in its progress than the plague, is accompanied with a carbuncular eruption, quite as mischievous and disgusting, and more certainly fatal in its issue. It was first distinctly described by M. Virgile, of Montpellier, who had practised with great reputation at St. Domingo. There can be little doubt of its being imported into the West Indies along with the slaves from the African coast; and is here called, as already observed, pian or epian, precisely synonymous with the African term yaw: the master-fungus being named mamma-pian, or mother-yaw, as supposed to be the source or supply of the rest. The fungous berries, in this form, precisely correspond to the carbuncle already described under the trivial name of *terminthus*, which consists of a "core or fungus, spreading in the shape, and assuming the figure and blackish-green colour, of the fruit or berry of the pea-nut, or terminthus of the Greeks."* And

* Cl. III., Ord. II., vol. i. Several of the febrile eruptive diseases are capable of affecting the same person only once during life; but, according to Mr. Mason's belief, the yaws is a solitary instance of a slow chronic disorder, producing similar constitutional changes, tending to future exemption. The time that elapses between the inoculation with yaw matter and the first appearance of a yaw tubercle on the spot where the matter was inserted, was found to be about three weeks. A dry scab was first formed, that remained stationary, and under it the yaw fungus became perceptible at the end of about three weeks, and soon afterward other tubercles appeared on the body. In the instances referred to by Mr. David Mason (Edin. Med. Journ., No. cvi.), there was no obvious constitutional disturbance. The following is the description given by him of the American yaws:—"The first appearance of this disease is usually indicated by a foul ulcer, variously and fortuitously situated, and which is ultimately ascertained to be the spot of inoculation, the skin having been previously broken, either by accident or design. At an early stage this sore resembles a simple cutaneous ulcer, and only becomes suspicious by not healing with the use of common dressing. In a short time, however, the edges become spongy, and of a whitish colour. The poison now begins to act on the constitution, and, in most cases, circular patches of minute papulæ appear in various parts of the skin, giving it a granular appearance. In time some of these papulæ enlarge, become elevated, and covered with a crust. When this scab is cautiously removed, the whitish, spongy, granular yaw is distinctly seen. When the tubercles are left to themselves they attain a considerable size, and a diameter for them of two inches is not uncommon. They are easily destroyed by caustic, without any mark or depression being left. For a few days the spot is distinguished by a deeper black colour than the surrounding skin, but it gradually fades into the natural colour. Mr. Mason has never seen a yaw tubercle on a mucous surface; sometimes at the angles of the mouth, but not on the lips, or in the nostrils. All yaw tubercles, he says, are composed of irregular circular segments, cutting each other more or less acutely, and forming waving lines around the base. The summit is often flat and depressed in the middle. Those of the strawberry shape are considerably elevated, and exhibit an irregular granular surface. In some parts, where the tubercles are numerous, they unite in clusters. Occasionally they appear in the form of a ring or semicircle, with a depression of sound skin in the middle. Whatever be their figure, they all discharge the same sort of matter, which is condensed into a similar scab, and which, being cautiously removed, shows the dingy granular surface underneath. Among healthy negroes, exposed to the simple action of the yaws, Mr. Mason noticed little constitutional disturbance. A tingling or itching sensation in the skin, and slight pains in the joints, were common, but not constant symptoms. The mother-yaw, or that caused by inoculation, which generally ulcerates, sometimes gives considerable pain. As the disease advances, and the yaws become large and numerous, the constitution shows more evident signs of disorder, debility, emaciation, &c.; but never, in ordinary circumstances, causing confinement, or, under proper care and regimen, depressing the spirits

the crab-yaws:—"Like the other yaws, they seem to arise from the true skin; but, being confined during their growth by the hardened cuticle, its resistance, together with the pressure in walking, creates intolerable pain, and inability to move except in a singular and awkward way, whimsically fancied to resemble that of the movements of a crab, whence the origin of the term. As the tubercles enlarge, the upper covering gives way, and they appear above the surface in the shape of granular yaws. They are easily removed by paring away the hardened skin around them, cutting off the projecting tubercle, and touching its root freely with caustic. It seems that the dangerous practice of keeping the feet immersed in a medicated and nearly boiling bath for nine days, is sometimes tried in the West Indies: Mr. Mason has known of some instances in which the method proved fatal. Ed.

has hence been conjectured, but without sufficient foundation, that the disease of yaws is referred to by Galen and Dioscorides under this name.

The erosive secretion from the carbuncles of this variety generally, but especially from the mother-yaw, spreads widely, and, in its meandering, destroys all the surrounding parts, not excepting the bones.* [Conradi is wrong in asserting that the pains in the bones affect only negroes, and not Europeans.—(*Grundriss des Pathol.*, b. ii., 826.) Dr. Winterbottom knew a European in Africa, a slave-dealer, who was dreadfully tormented with pains in his bones, in consequence of yaws.†] Nothing can exceed the revolting scene of a yaw-house, or hospital for the reception of slaves suffering under this disease, in the West Indies. "Here," says Dr. Pinckard, "I saw some of the most striking pictures of human misery that ever met my eyes. Not to commiserate their sufferings is impossible, but their offensive and wretched appearance creates a sense of horror on beholding them Of all the unsightly diseases which the human body is heir to, this is perhaps the worst. Some of these diseased and truly pitiable objects were crouching upon their haunches round a smoky fire; some stood trembling on their ulcerated limbs; others, supporting themselves by a large stick, were dragging their wretched bodies from place to place; while many, too feeble to rise, lay shivering with pain and torture upon the bare boards of a wooden platform."—(*Notes on the West Indies*, vol. ii., letter xxii.) Dr. Pinckard adds, that, "unhappily, this most odious distemper has not hitherto been found within the power of medicine: that it often exists for years, and, even where it sooner yields, its removal is more the effect of time and regimen than of medical treatment."

This view of the case is too generally true: but, from the length of time which, under the best treatment, is required to effect a cure, it seldom happens that these miserable wretches receive all the attention which their situation deserves; and they are rarely sufficiently heedful of personal cleanliness, which, even alone, is of the utmost importance. This, with a generous diet to support the strength, pure air, regular hours of rest, and such exercise as can be used without fatigue, with warm balsamic applications to the sores, have not unfrequently succeeded where the bones have not become extensively carious. But the latter stages of the disease are horrible when it proves fatal; for the pains are excruciating, the debility extreme, and the bones are covered with foul exostoses and corrupt ulcerations.*

It is happy for the European inhabitants of the West Indies that they are less liable to this miserable malady than their slaves; probably from using a better diet, and being more attentive to cleanliness. As yaws is communicated

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The eruption continues more or less numerous, until the disease is entirely extinguished, occasionally increasing and diminishing without any apparent cause. Towards the termination, the large tubercles often disappear, and a few others, after a considerable time, come out. Yet, during this interval of apparent recovery, the skin is seldom free from clusters of small papular yaws, which sometimes remain for weeks or months after every return of the larger yaws has ceased."—See Edin. Med. Journ., No. cvi., p. 57.—Ed.

* This does not agree with Mr. Mason's description, who informs us that the morbid secretion produces no immediate change on the surrounding skin, unless the cuticle happen to be broken.—(Edin. Med. Journ., No. cvi, p. 56.) He bears witness, however, to the bones of the legs and arms becoming affected with simple enlargement; to the extension of ulceration down to the periosteum; and to the bones becoming carious. These affections of the bones seem, like those of syphilis, often to continue for years after the other symptoms have ceased, and, in some instances, to prove fatal. The membranes of the nasal cavities sometimes ulcerate, and the adjacent bones become diseased, followed by frightful and incurable ulceration of the nose, palate, and throat.—Ed.

† Edin. Med. Journ., vol. xxx., p. 323. As already noticed, Mr. David Mason denies that the American form of the disease is necessarily connected with fever, and maintains that, when febrile disturbance is present, it is only an adventitious circumstance. From his investigations, it appears that the poison or infectious matter of yaws is never, under any circumstances, conveyed through the medium of the atmosphere. Actual contact or inoculation is essential to the production of the disease. With the design of avoiding any labour, the negroes in Jamaica, he says, often purposely inoculate themselves, and mothers their children about the period of weaning, as is done also in Africa. Yet, according to Mr. David Mason, it is proved by experience that this disease is not milder in childhood, but, on the contrary, more unmanageable, and liable to be conjoined with infantile disorders, and to prove dangerous. Although the disease is often propagated by intentional inoculation, no doubt it is in numerous instances communicated by the accidental contact of the matter with an abraded part of the skin.—Ed.

* Mr. Mason suspects, from what he has observed, that the mother-yaw might not only be healed by means of caustic, but the constitutional disease prevented, by inoculation before the system has been tainted. The aggravated effects of the disease he refers to neglect, and to accidental unfavourable states of the general health. An ample supply of nourishing diet, frequent bathing, and moderate or equable warmth, seem to him to be requisite in the treatment. He is also in favour of tonic and diaphoretic medicines. Mercury, he says, affords no decided benefit, and, in alterative doses, is prejudicial. The plan which he prefers consists in frequent ablution in the tepid bath; clean linen and clothing; decoction of sarsaparilla, with small doses of tartarized antimony; and, in a later stage, tonic medicines, especially preparations of iron, with full diet, and a liberal allowance of animal food. Anasarcous debility and functional derangement of the digestive organs, require frequent calomel purges, chalybeates, and proper diet. As a topical application, he commends the nitrate of silver, with which he not only destroys the crab-yaw, but others of long standing, which often linger in the skin after all signs of constitutional disease have ceased; and its effect on them was still more immediate and complete. Before the caustic is applied the scab must be removed, in order to let the caustic touch the spongy granular substance.—Ed.

in the same way as the venereal disease or the itch, it is just as much endemial in Africa as lues or itch is in this country. Were it not for the circumstances adverted to, Bertrandi's belief, that negroes are more disposed to this disease than whites, perhaps might not be correct. The same exposure might produce the same effects in the European as in the negro.*

* Winterbottom, in Edinburgh Med. Journ., vol. xxx., p. 322. On this point the following observations are made by Mr. Mason :—"There is no foundation for Dr. Darwin's observation, that the yaws is hereditary, nor is it exclusively confined to the negro or African race. Neither Europeans nor Creoles are invulnerable, although it occurs very rarely among them. These classes, and also people of colour, view the disease with peculiar disgust; and as they are not exposed to intermingle with the infected, but are careful to avoid such intercourse, nor have the same motives which so often prompt negroes to inoculate themselves and their offspring, we may find, in these considerations, sufficient ground for the above exemption. Something, however, may be allowed to the European constitution being less susceptible of yaws than the African."—Op. cit., No. cvi.—Ed.

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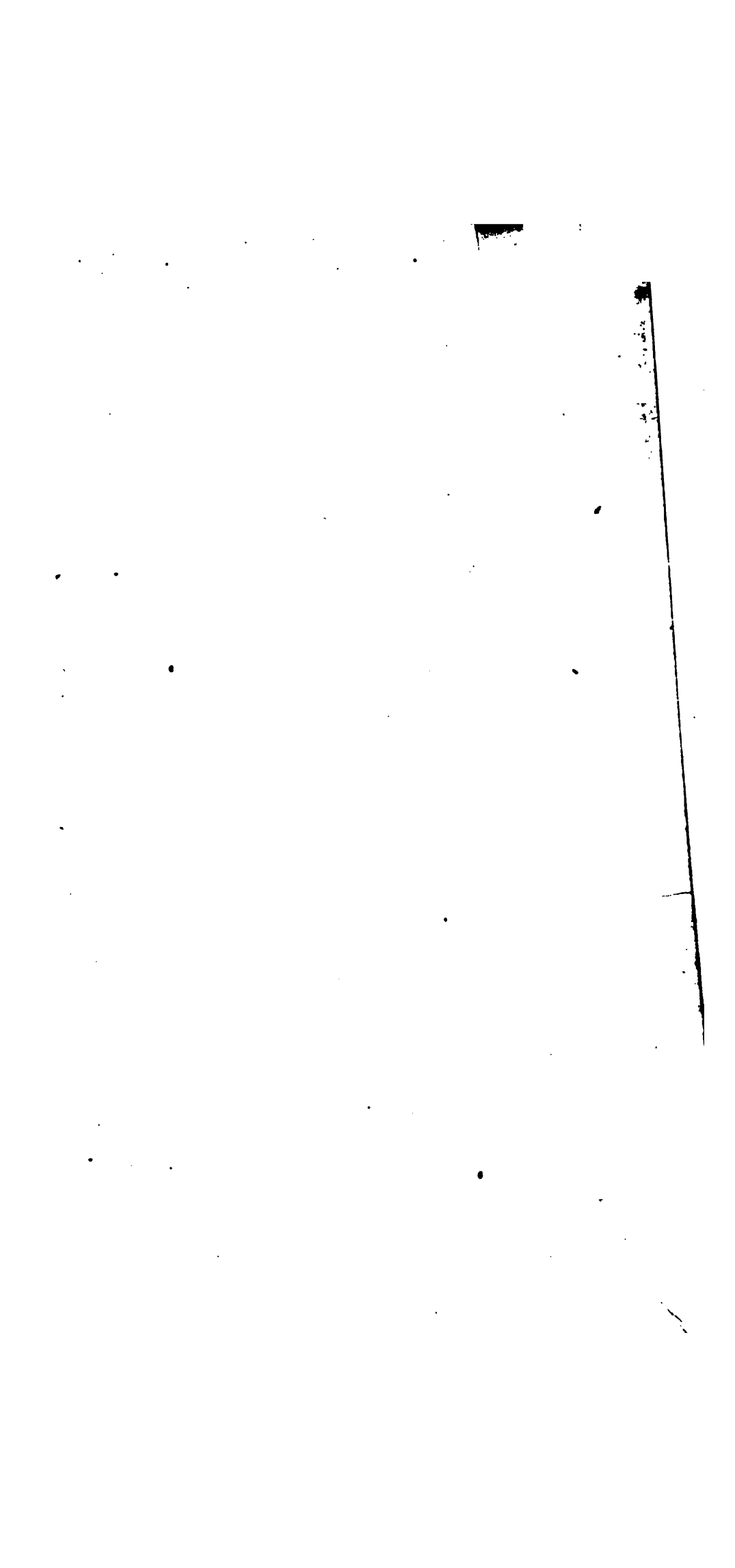

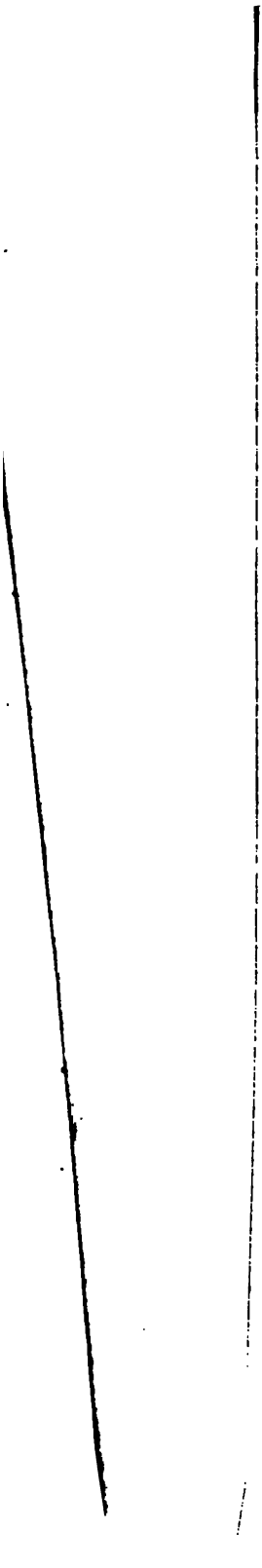

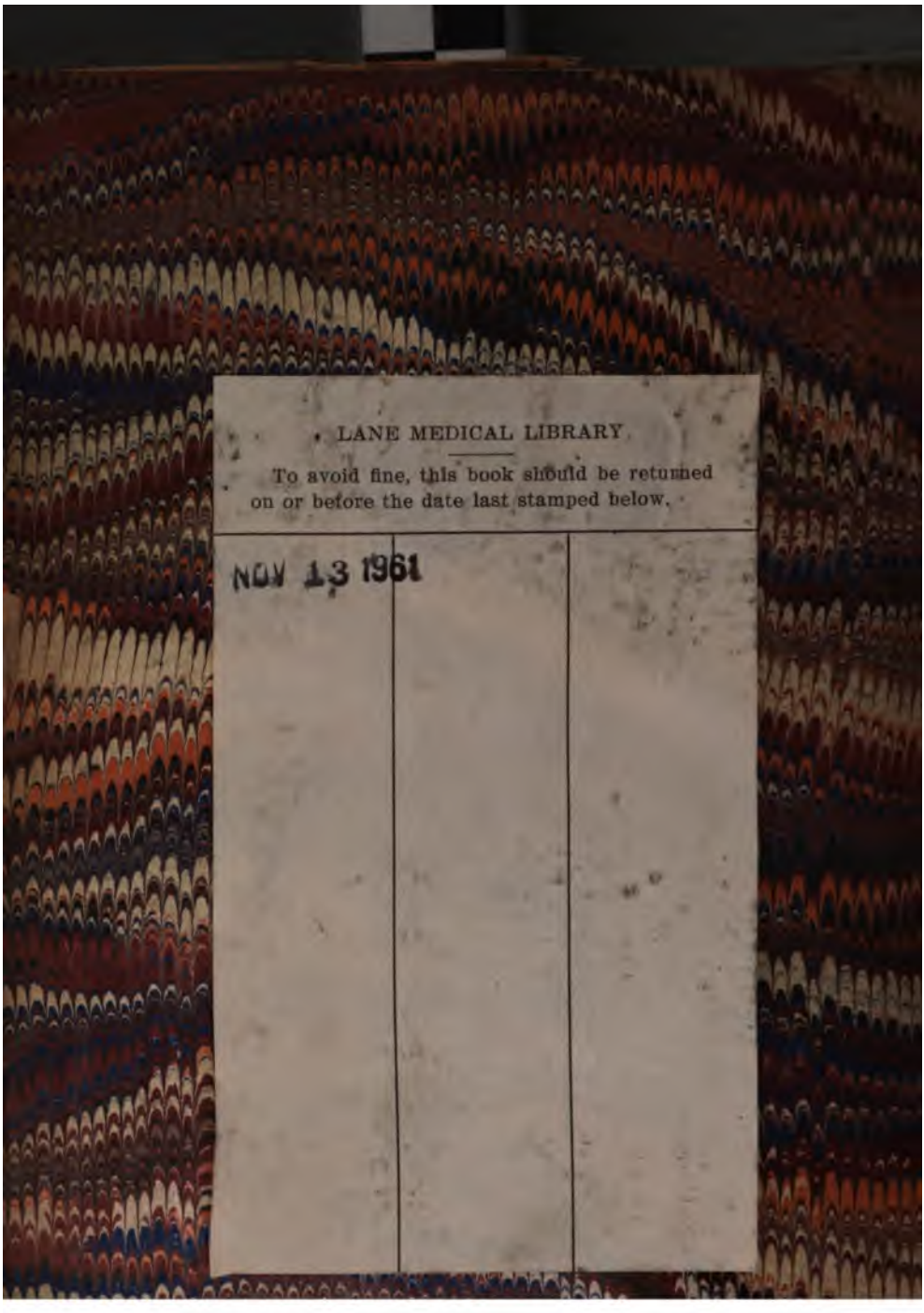
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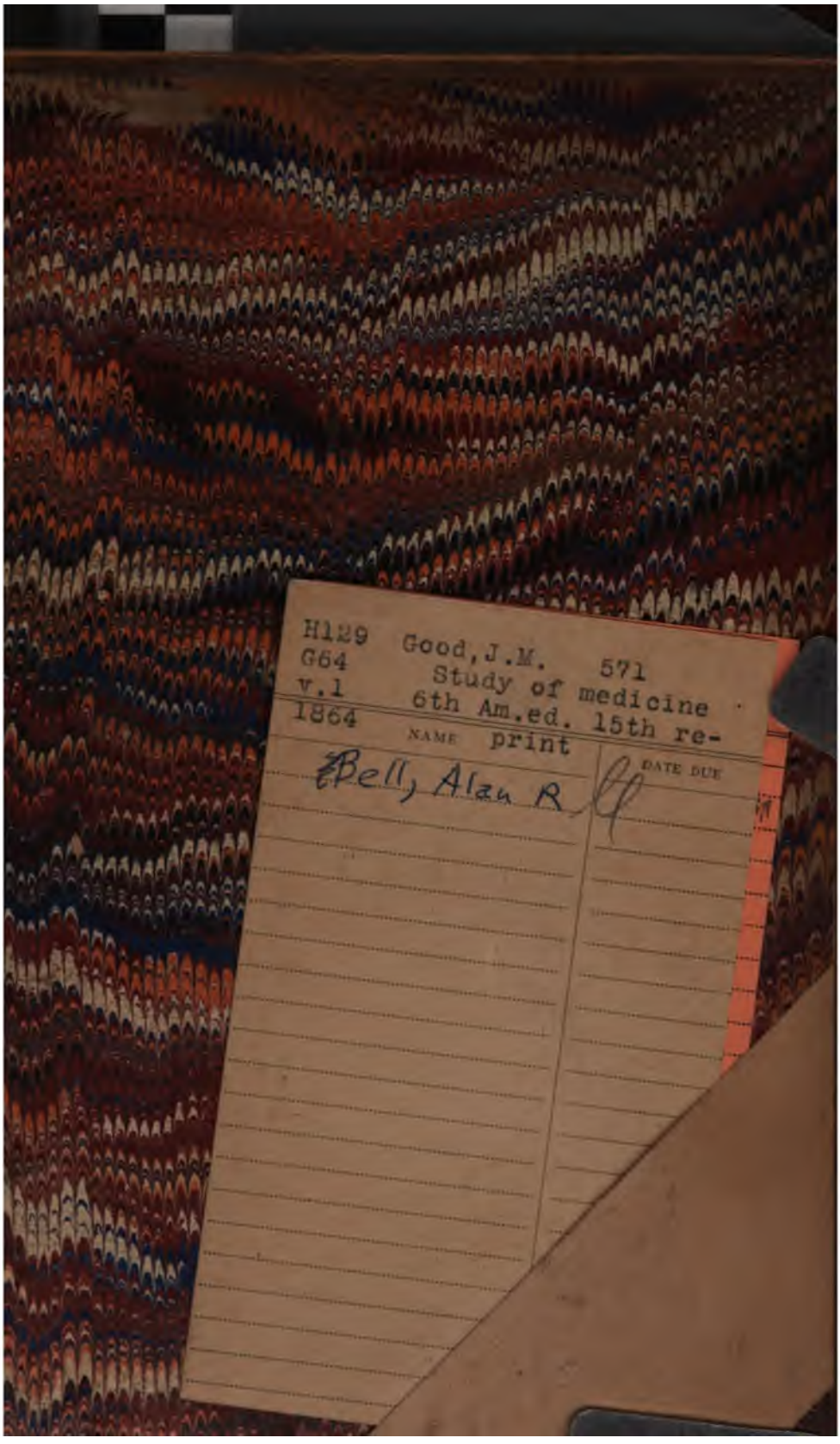
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